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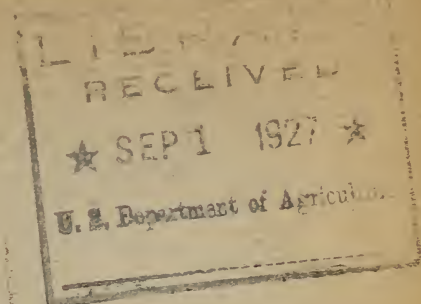
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Issued December 16, 1911.

United States Department of Agriculture,
OFFICE OF THE SECRETARY.

SACCHARIN

UNDER THE FOOD AND DRUGS ACT OF JUNE 30, 1906.

BEFORE THE SECRETARY OF THE TREASURY, THE
SECRETARY OF AGRICULTURE, AND THE SEC-
RETARY OF COMMERCE AND LABOR.

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United States Department of Agriculture,

OFFICE OF THE SECRETARY.

SACCHARIN

Under the Food and Drugs Act of June 30, 1906.

BEFORE THE SECRETARY OF THE TREASURY, THE SECRETARY OF AGRICULTURE, AND THE SECRETARY OF COMMERCE AND LABOR.

CONCLUSIONS OF THE REFEREE BOARD OF CONSULTING SCIENTIFIC EXPERTS ON THE INFLUENCE OF SACCHARIN ON THE NUTRITION AND HEALTH OF MAN.

The questions certified to the Referee Board of Consulting Scientific Experts by the Secretary of Agriculture bearing on saccharin are as follows:

1. Does a food to which there has been added saccharin contain any added poisonous or other added deleterious ingredient which may render the said food injurious to health? (a) In large quantities? (b) In small quantities?

2. If saccharin be mixed or packed with a food, is the quality or strength of said food thereby reduced, lowered, or injuriously affected? (a) In large quantities? (b) In small quantities?

To obtain satisfactory answers to these questions, the board has found it necessary to institute experimental investigations on the effect of saccharin and its sodium salt on the nutrition and general health of man.

The experimental work, on the results of which the conclusions of the board are based, was conducted by Prof. Christian A. Herter, of Columbia University, New York City, in collaboration with a number of competent physiological chemists and clinicians, and by Prof. Otto Folin, of Harvard University, aided by clinical and other assistants.

The subjects made use of in all the experiments were young men in normal health, and the doses of saccharin administered were adequate to cover any practical use of the substance for sweetening purposes.

In fixing upon the amounts of saccharin that should constitute a "small dose" and a "large dose," we have kept in mind the fact that the sweetening power of saccharin is approximately equal to 500 times its weight of cane sugar. The "small dose" adopted was up to 0.3 gram per day, while the "large dose" ranged from 0.75 gram to 1.5 grams daily. This would mean that the amounts of saccharin taken daily by the individual subjects corresponded in sweetening power to 150-750 grams of cane sugar per day, or approximately 5 ounces to 1½ pounds. In one of the experiments the subjects, seven in number, took almost uninterruptedly saccharin with every meal for a period of about five months, the doses ranging from 0.15 gram per day at the beginning to 0.75 gram per day at the end.

The conclusions reached as a result of the individual investigations are given in detail in the separate reports herewith presented, together with all of the data upon which these conclusions are based.

The main general conclusions reached by the Referee Board are as follows:

(1) Saccharin in small quantities (0.3 gram per day or less) added to the food is without deleterious or poisonous action and is not injurious to the health of normal adults, so far as is ascertainable by available methods of study.

(2) Saccharin in large quantities (over 0.3 gram per day, and especially above 1 gram daily) added to the food, if taken for considerable periods of time (especially after months), is liable to induce disturbances of digestion.

(3) The admixture of saccharin with food in small or large quantities has not been found to alter the quality or strength of the food. It is obvious, however, that the addition of saccharin to food as a substitute for cane sugar or some other form of sugar must be regarded as a substitution involving a reduction in the food value of the sweetened product, and hence as a reduction in its quality.

[Signed]

IRA REMSEN, *Chairman*,
RUSSELL H. CHITTENDEN,
JOHN H. LONG,
CHRISTIAN A. HERTER,
ALONZO E. TAYLOR,

Referee Board of Consulting Scientific Experts.

FOOD INSPECTION DECISION 135.

SACCHARIN IN FOOD.

At the request of the Secretary of Agriculture, the Referee Board of Consulting Scientific Experts has conducted an investigation as to the effect on health of the use of saccharin. The investigation has been concluded, and the Referee Board reports that the continued use of saccharin for a long time in quantities over three-tenths of a gram per day is liable to impair digestion; and that the addition of saccharin as a substitute for cane sugar or other forms of sugar reduces the food value of the sweetened product, and hence lowers its quality.

Saccharin has been used as a substitute for sugar in over thirty classes of foods in which sugar is commonly recognized as a normal and valuable ingredient. If the use of saccharin be continued, it is evident that amounts of saccharin may readily be consumed which will, through continual use, produce digestive disturbances. In every food in which saccharin is used some other sweetening agent known to be harmless to health can be substituted, and there is not even a pretense that saccharin is a necessity in the manufacture of food products. Under the food and drugs act articles of food are adulterated if they contain added poisonous or other added deleterious ingredients which may render them injurious to health. Articles of food are also adulterated within the meaning of the act if substances have been mixed and packed with the foods so as to reduce or lower or injuriously affect their quality or strength. The findings of the Referee Board show that saccharin in food is such an added poisonous or other added deleterious ingredient as is contemplated by the act, and also that the substitution of saccharin for sugar in foods reduces and lowers their quality.

The Secretary of Agriculture, therefore, will regard as adulterated under the food and drugs act foods containing saccharin which, on and after July 1, 1911, are manufactured or offered for sale in the District of Columbia or the Territories, or shipped in interstate or foreign commerce, or offered for importation into the United States.

FRANKLIN MACVEAGH,
Secretary of the Treasury.

JAMES WILSON,
Secretary of Agriculture.

CHARLES NAGEL,
Secretary of Commerce and Labor.

WASHINGTON, D. C., April 26, 1911.

HEARING ACCORDED TO MANUFACTURERS OF SACCHARIN, MAY 23, 1911.

Appearances: James Wilson, Secretary of Agriculture; Charles Nagel, Secretary of Commerce and Labor; Francis E. Hamilton, 32 Broadway, New York, representing the following manufacturers: Heyden Chemical Works, Verona Chemical Co., Monsanto Chemical Works, Fahlberg Saccharin Co., Harmon, Delaire & Schaeffer, Fries Bros.

Secretary WILSON. Gentlemen, we are here to listen to what you have to say with regard to the time of this saccharin matter.

Mr. HAMILTON. Might I ask whether it is proper for me to see a copy of the report of the Referee Board?

Secretary WILSON. It is in the hands of the editor; we only have one copy.

Mr. HAMILTON. And I was advised from your office that it would be about two months before it is published.

Secretary WILSON. I don't know how long that will be.

Mr. HAMILTON. Might I ask whether or not you personally had the opportunity of reading it?

Secretary WILSON. Yes, I did read it; I read it over when it came in.

Mr. HAMILTON. Did the other Secretaries have that opportunity?

Secretary WILSON. I don't know whether they did or not.

Mr. HAMILTON. Secretary Nagel, may I ask you whether you have read that report of the Referee Board of Consulting Scientific Experts?

Secretary WILSON. What is the object of this cross-examination of us?

Mr. HAMILTON. It is not a cross-examination.

Secretary WILSON. What have you to say with regard to the time that the board has given?

Mr. HAMILTON. We think it is exceedingly short, sir.

Secretary WILSON. Well, that is all the point we care to hear you about.

Mr. HAMILTON. You mean, then, that you limit anything I have to say to the single question of the time?

Secretary NAGEL. Suppose we get at it this way. I would be glad to have you state for my information what you would like to discuss; then we can tell you what we are prepared to hear.

Mr. HAMILTON. Well, I don't care to discuss the scientific proposition, because that is altogether too involved to ask you to listen to. I would ask you to take under consideration whether or not the food inspection decision in question 135 might not be so amended as to permit the use of saccharin, provided the quantity of the product was always below the minimum as fixed by the Referee Board as being at all possibly dangerous, and placing it upon the labels of the goods; secondly, if that were passed upon by the Board adversely, then we would ask a suspension of Food Inspection Decision 135 until May 1, 1912, to give us an opportunity to dispose of our goods and give us an opportunity in the meantime to present to your honors the absolute facts with regard to the use of saccharin, to satisfy, if possible, the requirements of the Referee Board's decision.

Secretary NAGEL. Then why don't you take them up in the inverse order, time first, and then consider the propriety of discussing other questions?

Mr. HAMILTON. Following the suggestion of the Secretary I would say that there are six manufacturers in this country. They have been manufacturing saccharin for a good many years; it has been made in this country for 25 years or more.

Secretary WILSON. Tell us how much time do you suggest?

Mr. HAMILTON. Following the action of the chairman, I will say that the Government, I think, ought to give us until the 1st of next May.

Secretary WILSON. I think the time already is long enough. You may have some reasons why it should be extended. Until the 1st of July has been given—that was on the 1st of May—making 60 days.

Secretary NAGEL. You have had 60 days; was that time allowed to dispose of the goods and make the change?

Secretary WILSON. It seems that the trouble is that they want to dispose of the goods. We are perfectly willing that they should dispose of them, and we supposed 60 days was long enough to dispose of them. However, I think we had better hear what he has to say.

Secretary NAGEL. Is it your purpose to abide by the decision?

Mr. HAMILTON. To abide by the decision of the Referee Board absolutely, but not necessarily by the decision of Food-Inspection Decision 135 until we have seen the Referee Board's decision and know whether 135 is written within it.

Secretary NAGEL. Then your position is that you have not seen the report; that you have been allowed 60 days; that you do not consider that time adequate to dispose of your goods; and that you have had no opportunity to make a change because you are not familiar with the conditions to govern it. [To Secretary Wilson.] Mr. Secretary, that strikes me with some force.

Secretary WILSON. I want to hear what they have to say.

Secretary NAGEL. Isn't it true that the board in making its decision admitted that a small percentage is not necessarily injurious, but that the danger is that using it constantly will render it dangerous?

Secretary WILSON. I suppose that is the principle.

Secretary NAGEL. Will you give us as briefly as you can your reasons why you need more time, and how important it is to be familiar with the details of the report?

Mr. HAMILTON. This decision came as a flash of lightning from a clear sky and was followed almost instantly by the food-inspection decision. The public has been told, the entire United States notified through newspapers and by the distribution of the food-inspection decision, that the use of saccharin is prohibited on and after July 1. You can readily see, as a business man, that it absolutely stopped right there every purchase of saccharin, because no man would be buying saccharin to be delivered to him during that 60 days to use in his product, which product was liable to be seized after the 1st of July.

Secretary NAGEL. It is not a question of your disposing of it, but of the next man.

Mr. HAMILTON. Absolutely, sir. I may say, gentlemen, that while the food-inspection decision states that saccharin has been used in some thirty-odd food products, at present it is not used in any products except diabetic food products and soda water and, perhaps, one or two others. It is not used in corn or jellies any more.

Secretary WILSON. Why?

Mr. HAMILTON. I can't tell; that is a business proposition. I heard that corn packers were advised by Dr. Wiley that he eventually would be able to have some such regulation as this issued, and they wanted to watch out or else he would stop it, and I am quite inclined to believe it.

Secretary NAGEL. With how short a period can you be satisfied? I mean reasonably. In how short a period can you do it?

Mr. HAMILTON. Well, here are the representatives of the manufacturers; they can tell you better than I.

Mr. QUEENY (of the Monsanto Chemical Works, St. Louis, Mo.). I do not think the food can be gotten off the market inside of a year. I do not think we can dispose of the stock on hand or dispose of the products they have used it in in less time than that.

Mr. HAMILTON. There is one other suggestion and that is that it has been called to my attention that not alone are contracts for raw material in operation now and much material on hand, but as well every one of these works have contracts with their chemists and with the parties to whom they are selling all those things. They are contracts which run in the natural course of events during the year;

some may expire between now and the first of next May, but the opportunity of disposing of their goods to such parties as can use the goods and dispose of them for consumption before the inhibition of Food Inspection Decision 135, it does seem to me would hardly be served by any time less than May 1.

Secretary NAGEL. How was this change effected in other countries?

Mr. HAMILTON. In Germany there was a strong opposition to the saccharin product being made and sold on the part of the agrarian group—those raising beet sugar—and after a period of disturbance and struggle the Government finally purchased, by paying six years' profit to every manufacturer, all their right and title, and gave them from May of one year until April of the next to dispose of the stock they had on hand—paid them a bonus of six years' profit, and gave them 11 months to dispose of the stock on hand. There is one factory which now manufactures under the control of the Government for pharmaceutical purposes.

Secretary NAGEL. Have you the experience of any other country?

Dr. SIMON. The time when saccharin was invented and first made in Germany was shortly after the Franco-Prussian War, and, of course, everything that came from Germany into France was opposed. They got the Government to make experiments with saccharin, and the Government found that saccharin might be injurious. The people on whom those experiments were made were sugar manufacturers. The people who gave their opinion for the Government had gone on record before that by stating that saccharin was not considered injurious by them. Only after they had directions from their Government to investigate this matter for the Government they found that it might be injurious and prohibited, as far as I know, not the manufacture and sale, but the importation. Saccharin is now made in a large way in France itself. Italy and Spain are always following the precedent of France in hygienic matters; whatever is done in France is followed in Italy and Spain, so this is the reason why saccharin to-day is prohibited in these countries. In England it is not prohibited; it is used there. The English people have put a tax on saccharin. The reason that it is prohibited in Germany is that the Government realizes a heavy tax on sugar, and they thought that the sale of saccharin was taking away from the tax, and they directed the board of health to make experiments. The board of health decided that there is absolutely no reason why saccharin should be prohibited from any sanitary point of view. I do not say this in any way as a point against the Referee Board; I am just giving you the facts as far as I know them. Then the question was asked, "Couldn't we put a tax on saccharin?" This was denied for the reason that the collection of this tax would be so expensive that it

would only be more costly than what they could get from the tax, so they decided to proceed in the way Mr. Hamilton just explained to you.

Secretary NAGEL. Is the use of this product more strictly controlled and regulated in England, for instance, than it has been in our country?

Mr. HAMILTON. No; the use of it is perfectly free.

Secretary NAGEL. Was it more strictly controlled in Germany?

Mr. HAMILTON. It was perfectly free.

Secretary NAGEL. So that the conditions that obtained there were similar to those with which we have to deal here?

Mr. HAMILTON. They were exactly the same.

Secretary NAGEL. And under those conditions Germany paid for the profits of six years computed on some basis——

Mr. HAMILTON. On the basis of the previous six years' profits.

Secretary NAGEL. And then gave a year's time to make the shift?

Mr. HAMILTON. I guess it is 9 or 10 months [refers to paper]; the decision came out on the 7th of July, 1902, and went into effect on April 1, 1903—9 months. In regard to the time, saccharin is not manufactured in the same amount in the hot summer as it is in the cold weather; the chief consumption is in the warmer weather. The manufacturers, therefore, have considerable stock at the present time and, of course, there are the contracts for raw materials and contracts with chemists. We have a staff of men and could not under any circumstances throw these men right off. The market for labor is very poor and these men have been with us for 10 or 11 years and we have to look out for them. They have families, and I should say something like 300 people, including the men, their wives, and children, are affected and would lose their living if this decision went into effect at once. Of course, if it was a question of affecting the health of the people in a dangerous way, I would not plead for an extension in any way. Dr. Fries can explain the English condition very thoroughly.

Dr. FRIES. In Great Britain after the Boer War they placed a tax on sugar and at that time the question came up about prohibiting saccharin on account of the revenue acquired on sugar, but the board, or whoever decided the question, came to the conclusion that there is no reason to keep out saccharin, and to-day saccharin pays a revenue just the same as sugar, in proportion to its strength, and anybody importing saccharin to England has to pay that duty.

Mr. JOHN F. QUEENY (of the Monsanto Chemical Works, St. Louis, Mo.). We entered into the manufacture of saccharin in 1901. Before going into the manufacture we looked up the Government data on it and I found under Government Bulletin No. 13, published in

1892 by the Department of Agriculture, under the head of saccharin it reads:

It seems probable that in most cases it is not particularly deleterious to the human system,

so we went into the manufacture of the product in good faith. At the time the pure-food bill was under consideration, when in the hands of the committee of the Senate, I appeared before the committee and asked them how this bill would affect saccharin. I have a full report of the discussion that took place at that hearing. The essential features that were brought out were as follows:

Senator Latimer says—I was asking for a modification of the particular word “deleterious”—Senator Latimer said:

If you put in an amount which does not render it injurious I do not see how the proposed law will reach you.

and I replied:

But it is a poisonous ingredient if taken in large quantities.

Senator Latimer:

But it has to be put in in quantities large enough to become injurious.

So the intent of the law seems to me to be fully brought out in this Senate hearing. Now, the quantity estimated by the Referee Board is three-tenths of a gram, which is equal to $4\frac{1}{2}$ grains taken daily and for a long time, when it is liable to impair digestion. Now, I have compiled the statistics of sugar consumption, which amounts to seven billion pounds annually, equal to 81 pounds per capita annually, which brings it down to 100 grams daily for the entire population of the United States. Now, 100 grams has the same sweetening power of 3 grains of saccharin; therefore, the three-tenths of a gram, the minimum limit of the Referee Board, is just 50 per cent more than the known consumption of all sweetening in the United States. Therefore I contend that it should not be prohibited because an excess quantity of 50 per cent is liable to impair digestion. I am not questioning the actions or findings of the Referee Board, but their finding is that 50 per cent more than the total sweetening consumption in the United States to-day is liable to impair digestion. It is a very important point in this discussion, I think. As to the enforcement of food-inspection decision 135 on July 1, I think it is an awful hardship on all manufacturers.

We have contracts for raw material and the manufacturers who use saccharin have their products all over the country, and you can not get it in within 60 days. The first objection ever raised against saccharin was by Dr. Wiley when he expressed himself in an unofficial statement, but never has anything official come from this Government other than this bulletin, which states that it seems probable that in most cases it is not particularly deleterious to the

human system, and on the strength of that did we go into the manufacture of saccharin. I am speaking of my company now. The Government sanctioned the use of the article in that statement and we entered into the manufacture of it. Are we going to be put out of business on the basis that over 50 per cent of the known consumption of sweetening is liable to impair digestion? There is not any case of record anywhere where any single individual has been harmed by the use of saccharin. You can not use that quantity because that quantity is more than 50 per cent of the normal consumption. If used in an excess quantity, it produces bitterness and is rejected by the stomach.

Mr. HAMILTON. Just a suggestion at this point. Suppose that the quoted part of the Referee Board's decision which appears in the food-inspection decision reads:

The Referee Board reports that the continuous use of saccharin for a long time in quantities over three-tenths of a gram per day is liable to impair digestion.

Let us suppose in lieu of that, they had been discussing sugar and it read:

The Referee Board reports that the continued use of sugar for a long time in quantities over 6½ ounces per day is liable to impair digestion,

and I will submit this whole proposition on the fact that the Referee Board will hold that this is true, that if you use that amount per day it is liable to impair your digestion.

Mr. QUEENY. The opposition that developed against saccharin from the literature on the subject is precisely the same as developed against the use of sugar when it was first introduced. The sale was restricted at drug stores precisely the same as it is attempted to do on saccharin. Now as to the harmlessness, Mr. Hamilton has just stated that the excess of quantity of sugar is liable to impair digestion.

Secretary NAGEL. We are not to take up that branch of the question now, because you accept the quantity in the Referee Board's statement.

Mr. QUEENY. Yes, but we want to bring out the fact that the decision is based on a quantity which it is impossible to use in food products because of its effect. It brings about an effect opposite to sweetness; it brings about a bitterness and the stomach rejects it, and it is a known fact. Consequently if we had the entire report of the Referee Board we could probably digest the argument with our chemists.

Secretary WILSON. We will try and get you a copy of it just as soon as we can.

Mr. HAMILTON. We haven't anything to argue on except those three lines. Those are the only lines of the Referee Board's report that we have to argue on.

Secretary WILSON. I want to say frankly to you gentlemen that the Referee Board was organized and put in action for the very purpose of conserving the interests of the manufacturers by insuring them a sane hearing, and that being the case it is the best the Government can do. When we get that information from them what would you have us do?

Mr. HAMILTON. We don't question the Referee Board for a minute. We don't question the honesty of the board at all, but we question the decision of the Referee Board's report as made because you have taken a quantity of 50 per cent in excess of the known consumption, which will put us out of business.

Secretary WILSON. You know exactly what the Referee Board says. You don't know the actual amount of sugar consumed in the United States; that is guesswork. That has not been gotten as carefully as the Referee Board got their facts. I have never believed the estimates of the amount of sugar the people are using; they have doubled it up periodically.

Mr. QUEENY. But we can make all kinds of liberal allowances and still be within the limits. Some say it is five billions, some six billions, and some seven billions.

Secretary WILSON. I think they have gotten it too high.

Mr. QUEENY. So much the better, then, for the saccharin. If it is less than that, then so much the better; my argument is based on the immense quantity of sugar consumed, which, figured down to the amount of saccharin, makes three grains a day. Consequently, so much stronger has the referee board's report sustained us in our contention that the ruling is unjust to us.

Secretary WILSON. After having the referee board's report it is of no use to argue with me, but I do sympathize with you in regard to the time you ought to have, and you are wasting your time in talking against the referee board.

Mr. QUEENY. No; I am not talking against the referee board. I contend that the report as based on their findings after a long examination——

Secretary WILSON. Couldn't you let us have what you care to say in regard to the length of time you require?

Mr. QUEENY. Yes, sir. I have asked for a year.

Secretary NAGEL. The impression I get is this: I think we are getting away from the question we originally intended to discuss. Of course, we are here to enforce the pure-food law. I have a department that is interested in promoting commerce, and if they clash commerce would have to yield; that is, if there is danger in

the product, it will have to subside. But where the question is a close one and no immediate danger is involved, it seems to me every consideration ought to be shown.

Secretary WILSON. I think so, too.

Secretary NAGEL. Yes; I know you do; we talked about this before we came in. Now, I get the impression in this case that it does not present a question of immediate and necessary danger, but it presents a question which is involved in a good deal of scientific doubt; really a question of policy with respect to which some countries have adopted one and other countries have adopted another. Such an advanced country as England has not come to our conclusion. Germany came to it reluctantly and was careful to guard the interests in making the change. Now, under those circumstances, aided by the circumstance that these gentlemen have not even seen the report, it does seem to me that we can afford to be very fair in giving time to make the shift.

Unnecessary destruction we can not advocate; and I am disposed, in view of the experience in other countries and our own position, to advocate a very generous extension of time for this change. As I gather, the product is not used in quantities different from those that have governed in other countries, so that we are dealing practically with conditions similar to those that have been dealt with by other countries, countries that are just as far advanced as we are; in fact, Germany may be regarded as the leader in these questions. She ought to furnish a pretty safe example for guidance. So it does not seem to me to be a question of a few months. The report itself does not condemn the use in a single instance; it is not the use several times, but it is the long-continued use which, by the accumulation, may result in danger. We know we are going to stop it, and I think we know it is not necessary for public safety to stop it at once, or even within six months. We may make a very liberal extension without danger to the public and for the protection and promotion of justice. So it seems to me.

Secretary WILSON (to Secretary Nagel). That is the matter these gentlemen are interested in. [To the manufacturers present.] That is what you are interested in, the discussion of the conclusion of the Referee Board is wasting your time.

Secretary NAGEL. Suppose we state our attitude upon this one question, or do you wish to have the Secretary of the Treasury participate in the decision? He will be back in a week, I think.

Secretary WILSON. I will leave the matter to you and Mr. MacVeagh to fix on the time, and I will agree to it.

Adjourned.

FOOD INSPECTION DECISION 138.

SACCHARIN IN FOOD.

Paragraph 3 of Food Inspection Decision No. 135 is hereby modified to read as follows:

The Secretary of Agriculture, therefore, will regard as adulterated under the food and drugs act foods containing saccharin which, on and after January 1, 1912, are manufactured or offered for sale in the District of Columbia or the Territories, or shipped in interstate or foreign commerce, or offered for importation into the United States.

FRANKLIN MACVEAGH,
Secretary of the Treasury.

JAMES WILSON,
Secretary of Agriculture.

CHARLES NAGEL,
Secretary of Commerce and Labor.

WASHINGTON, D. C., *June 20, 1911.*

HEARING OF SACCHARIN MANUFACTURERS, NOVEMBER 22, 1911.

OFFICE OF THE SECRETARY OF THE TREASURY,
WASHINGTON, D. C.

Before the Honorables Franklin MacVeagh, Secretary of the Treasury; James Wilson, Secretary of Agriculture; Charles Nagel, Secretary of Commerce and Labor.

Appearances: Warwick Massey Hough, Esq., St. Louis, Mo.; Mr. John F. Queeny, president, Monsanto Chemical Works, St. Louis, Mo.; Francis E. Hamilton, Esq., 32 Broadway, New York, N. Y.; Dr. Harold H. Fries, 92 Reade St., New York, N. Y.

Secretary WILSON. You can arrange the order in which you want to speak. We would like you to be as reasonably brief as you can be, considering, of course, that you will be expected to say all you want to say.

Mr. W. M. HOUGH. I think I can say everything I wish to say inside of 30 minutes, and probably half of that time. I will open the statement and Mr. Hamilton will close it. I represent Mr. Queeny and the St. Louis interests; I think Mr. Hamilton represents the New York interests.

I will state that saccharin, as you all know, was a discovery that was made about 30 years ago. It is a coal-tar product, which has a sweetness about 500 times as much as sugar, volume for volume. Its discovery was hailed as a great scientific discovery, a great economic discovery, and it was in course of time recognized by the medical profession as a very valuable discovery. In some instances it came to be used in places where sugar had previously been used as a sweetener. It was particularly valuable in cases of that kind because of its small volume; it did not displace, practically speaking, anything to which it was added.

As for illustration, if a can of corn is sweetened with sugar, the consumer has as much less corn as the volume of sugar which is used to sweeten it. If it is sweetened with saccharin, there is practically no displacement of the corn, nor, I may say, is any food value added. It simply furnishes the sweetener that is desired by many people. Physicians have prescribed it in diabetic cases, in gouty cases, in rheumatic cases, in cases where sugar has done great damage to the human

system. And in time, because of its use in that way, it has come to be used in different kinds of food where a sweetener is needed, probably originally for diabetic people, people who want prepared foods, who can not use prepared foods with sugar in them. Of course, it is obvious that if a man buys a can of corn he is not expecting to buy sugar; it is the corn that he is after, and he likes it sweetened. There is some objection to the use of sugar in many instances because of its tendency to ferment in the system before thorough assimilation, and much has been written in scientific and medical journals on this subject. The Referee Board found that saccharin was not a poison. If it is to be called a drug, it is a harmless drug, and I am making this statement because of statements which have appeared in the press of the country to the effect that this was a poison. I have examined and I have here the full report of the Referee Board, and the detailed report is very much more favorable to saccharin than the conclusions. In stating their conclusions they stretched a point with reference to one of the questions which was submitted and which I will notice in a minute.

Now, a word historically on the subject of sweeteners. We all know, who have read on the subject of sugar at all, that the original sweetener was honey, and sugar was discovered about the year 700. Now, for more than 1,000 years after the discovery of sugar, sugar was regarded as a drug and a poison. Think of it! For more than 1,000 years, down to about the seventeenth or eighteenth centuries, when coffee and tea commenced to come in, some other form of sweetener was needed than that which the human race had up to that time used, which was principally honey. The beekeepers of the world attacked the use of sugar and declared it to be a poison and detrimental to health, but the demand for something of that kind was greater than the opposition to it, and its use has grown to a remarkable degree. Sugar, as we know, has some food value. The human system needs a sugar, but it needs cane sugar, according to the authorities, much less than it needs a fruit sugar or a honey. That kind of sugar is much better than the cane sugar for the human system because in the cane sugar there are other things which are detrimental to health.

Secretary MACVEAGH. Is that true also as to beet sugar?

Mr. HOUGH. The same as to beet sugar. For 1,000 years sugar was regarded more adversely than saccharin has been regarded by its worst enemies up to this time. The increased consumption of saccharin naturally led to some opposition on the part of the sugar producers of the country, but I think much that has appeared in the public press is due to a press bureau which has been maintained by that interest. We know that interest has gone around in the various States making efforts to get adverse legislation against the

use of saccharin. In most of the States they were told that the matter was being investigated by the Referee Board and in the majority of them action was held in abeyance. In my own State, Missouri, a law was passed, but it was confined exclusively to beverages and there was no prohibition against the use of saccharin in mixtures of foods, prepared foods, and, if I am not mistaken, after a conference with the governor and food commissioner, it was decided not to enforce it even on the drinks until the report of the Referee Board was in, so that no injustice might be done. And it is quite natural, in view of the fact that the use of saccharin has increased even more rapidly than sugar did between the year 700 and the year 1700 or 1800—it is quite natural that anything that would feel itself being gradually displaced would use every effort to create an erroneous impression, so as to retard, if not prevent, its use altogether.

Now, the food and drugs act was passed by Congress in 1906, and one of the provisions of that act is that nothing can be added to a food which amounts to an adulteration, and adulterations are defined as, among other things, anything which is poisonous or deleterious. That leaves unsettled the question of what is poisonous or deleterious. The Bureau of Chemistry took very pronounced and very erroneous views, as some of us think, on this question, as well as numerous other questions. This matter finally found its way to the then President, Mr. Roosevelt, who, unfortunately for the Bureau of Chemistry, had been using saccharin himself for years and years. And when he was told by the Chief of the Bureau of Chemistry that it was a poison he expressed himself, so the papers at the time said, very forcibly. He said, "I have been using it for a long time," and I have with me here a recent letter written on the subject, which he said was not for publication, but which my client was at liberty to show to the three secretaries, indicating his opinion on the subject, if anything was needed in addition to the Referee Board's report. Mr. Roosevelt caused, I think, through the Secretary of Agriculture, this question to be referred to the Referee Board.

Now, before we saw the report of the Referee Board a food-inspection decision was issued, signed by you three gentlemen as the three secretaries named in the act with authority to make certain regulations, which was designed to give effect to the finding of the Referee Board. We are here to-day not to criticize the finding of the Referee Board; if it were necessary to go outside of their finding we could support their finding by the highest scientific authority, chemical and medical, in Europe as well as this country, to the effect that saccharin in the amounts in which it is ordinarily used by individuals is perfectly harmless, and it is not a poison in the sense in which that term is usually used; but we need not go behind the report of the Referee Board, because if you will read the conclusions in con-

nection with the detailed report you will see that they could not have given a cleaner bill of health to saccharin than could be given to anything which goes into the human system at all. It is true that they went a little further in the benzoate of soda case, and probably made a mistake, because no one can say that there is anything which is not going to or is liable to impair digestion if you take it in excessive quantities. I can eat meat and bread to excess and disturb digestion; I can take any of the condiments and spices and disturb digestion, and that is all that they have said of saccharin—when taken in excess—and they don't even say that it does as a matter of fact, but that if persisted in in amounts—roughly figuring in my mind—10 or 15 times in excess of what is ever taken, it is liable, after a very long period of time, to impair digestion. Now, that is just as weak a criticism of a substance as it is possible for a scientific board to make, because you can say the same thing of any substance that goes into the human system, either by itself or mixed with other foods.

Now, this is what the Referee Board reported: First, "saccharin in small quantities (0.3 gram per day or less) added to the food is without deleterious or poisonous action and is not injurious to the health of normal adults, so far as is ascertainable by available method of study." And they go further and say, "The admixture of saccharin with food in either small or large quantities has not been found to alter the quality or strength of the food." Now, in the face of that clear and explicit statement by this Referee Board, isn't it perfectly obvious that the use of saccharin should not be prohibited altogether? It seems to me that that is a conclusion which we can not escape; the use of saccharin must not be prohibited altogether. The board went on and stated further: Saccharin in large quantities—that is, over 0.3 gram per day, and especially above 1 gram daily, which is $3\frac{1}{3}$ times as much—added to the food, if taken for considerable periods of time, especially after months, is liable to induce disturbances of digestion. Why, we could say that about anything! We can certainly say it about its corresponding sweet value of sugar, because the chief thing that it displaces is cane sugar, and cane sugar used in corresponding volumes is infinitely more dangerous to health.

And they went on: "It is obvious, however, that the addition of saccharin to food as a substitute for cane sugar must be regarded as a substitution involving a reduction in the food value of the sweetened product, and hence as a reduction in its quality." Now, that simply means that if a man expects, when he buys a particular kind of food, to have that sweetened with sugar, and it is sweetened with saccharin, then it is a substitution to that extent because of two reasons: First is, he don't know what the sweetener is; and the second is that if sugar is used there is some food value to sugar, whereas,

for the sake of argument, we may say that there is no food value to saccharin, but that objection is obviated by the willingness of manufacturers and users to state upon the label that it is so used and the amount in which it is used, thus giving the man who may have some disease which would prevent his using a food which is sweetened with sugar the right to use a food which is sweetened with saccharin, as long as the human system craves sweet things, just as he has the right to take it, as President Roosevelt says he does, without any deleterious effects.

Now, in view of the statement of the Referee Board that in excessive amounts it is liable to impair digestion after a long period of time, it seems to me that it is perfectly possible to so limit the amount in which it is used in any food as to make it absolutely impossible for any man in any one day to get even one-half of what they say is perfectly safe. Now, if that is the case, in view of their statement that in quantities of 0.3 gram per day it is perfectly harmless and that its addition to food does not alter the quality of the food in any way, in other words, the corn is just as good, is not impaired by the addition of that sweetener, that instead of prohibiting the use altogether, which I think would be a very great mistake, scientifically, economically, and otherwise, and from a standpoint of health, it ought to be perfectly easy to make a regulation which would permit of a limited use and require that its use should be stated or claimed by some appropriate statements on the label, and thus you meet every possible objection that could be urged against it. Now, gentlemen, that is our case. It seems to me a perfectly clear case. The statement of it carries its own argument with it. The food-inspection decision which was issued did not recite all those parts of the report of the Referee Board which I first quoted, but only cites the last part. I have read to you all parts of the conclusions, that which is favorable and that which is unfavorable. Now, I think, and all that I have been able to read on the subject indicates, that this is a valuable discovery.

It ought not to be throttled in its infancy. It is economically good, it is healthily good, because it has been prescribed by physicians and is being prescribed by physicians to-day all over the land for people who can not use anything that has cane sugar in it. And this board ought not, in view of that conclusion by the Referee Board, which I say can more than be substantiated by outside scientific opinion, ought not by their action to create or further affirm the erroneous impression which has already gotten out in some quarters that this thing is a poison and deleterious to health. It is a benefit to mankind, and I believe it is a benefit which will grow when it becomes better known. Why, if we had had a pure-food law when sugar was being attacked by the honey keepers and it was to be

enforced under the radical views which have pertained, with all due respect to the head of that department, in the Bureau of Chemistry, why, we would not have had any sugar, more than likely, because everything that could be said against saccharin could have been said with greater effect against sugar. Saccharin produces no disease, but sugar produces disease.

Sugar produces any number of evils that man is heir to. And this displaces no food value; I mean by that when added to corn or any other prepared food the board says it does not alter or vary the quality of that food at all, and when a man buys the food he is expecting to get the food value of the particular food and not the food value of sugar. If he wants that he will buy it separately. While it has been said that it is commonly known that sugar is used, I think it is a mistake; it is not commonly known. I think I am a man of average intelligence, and I never knew until recently—and I lived for 35 or 40 years before I knew—that they ever put sugar in canned goods. I have learned it since I have been in touch with the operations of the food laws. We have learned a great many things, some of them bad, especially when we are told that things we have been using from childhood up are deleterious to health.

Now there is no restriction on saccharin in England. There is a restriction on saccharin in Germany, but not because of health. That is because the Government over there is practically in the sugar business, and they thought it would interfere with the revenues which they get from sugar, so they provided that nobody but the Government could make saccharin. But they at least did the fair thing with the manufacturers, and that was that they paid them for the value of their plant and five years' profits in advance to quiet them.

Secretary MACVEAGH. What is your authority for saying that in Germany their motive was to protect sugar from the competition of saccharin?

Mr. HOUGH. Well, just what has appeared in the press.

Secretary MACVEAGH. There is nothing in the record to prove that?

Mr. HOUGH. Mr. Hamilton will probably be able to give you more information on that; I am just outlining the case. Now at one time in France they did say it was a poison. That was the time that this came from Germany, and they did not want anything in France that came from Germany.

The point is, we have got our report of the Referee Board and other scientists which sustain the finding of the Referee Board; the main point is that the food-inspection decision which was first issued on the subject, which prohibits the use in foods altogether,

does not, in my opinion and the opinion of my associate, and the opinion of those whom we both represent, who are scientific men, does not clearly represent the conclusions of the Referee Board, which we are willing to stand on, and we submit that it is not a scientific question, that you gentlemen can read it and see for yourselves that if they say it can be used in certain amounts without harm, and does not impair the food value of the substance to which it is added, that its use should not be prohibited, and that is what we ask. I thank you, gentlemen, and that is all, unless you would like to see the letter of our late president on the subject. I don't know that it adds anything to it.

(The letter from ex-President Roosevelt above referred to was examined by the three secretaries and returned to Mr. Hough without being incorporated in the record.)

Secretary WILSON. Which of you gentlemen desire to be heard next?

Mr. HAMILTON. I represent the New York and vicinity manufacturers. I think that the representation on the part of Mr. Hough and myself includes all the manufacturers of saccharin. May I as briefly as possible state what I know with regard to the German proposition?

Secretary WILSON. State whatever you please to say.

Mr. HAMILTON. Thank you, sir. As I understand, from such records as we have received from Germany—it is not a part of this record, nothing appears in this record with regard to foreign countries except excerpts from foreign scientists. As I understand it, the agrarian group in Germany found the manufacture and sale of saccharin rapidly infringing upon the manufacture of beet sugar, and the matter was taken up in the Reichstag and eventually it was decided that they would place the manufacture of saccharin under the control of the German Government, one manufacturer alone making it, and all the other manufacturers were paid for their entire plants and paid, I am informed, a six-year profit, an average profit of six years upon the business.

Secretary MACVEAGH. Is there one manufacturer there now?

Dr. FRIES. One at present; Fahlberg.

Secretary MACVEAGH. Is it used there for general purposes as it is here, or is it used there as a substitute for sugar?

Dr. FRIES. It is sold now in the drug line, and the price has made it prohibitive to be used as a general sweetener as sugar has been used.

Secretary MACVEAGH. In other words, it is manufactured there as a drug?

Mr. HAMILTON. Yes; and as a source of income to the Government. The pure-food law has taken up from time to time the investigation

of various subjects and carefully investigated the same, this being one perhaps of five or six that have been referred to the Referee Board, and this report, as you gentlemen have doubtless discovered by even glancing at it, is exceedingly full and complete, giving day by day the results upon a series of experiments through a period of five to six months under the charge of such men as Dr. Herter and Dr. Folin, scientists of the highest standing in the United States. It is not to be expected that you gentlemen can give the time to a consideration of this voluminous report, and because of that fact I have made excerpts from it and would like to read a portion of these excerpts to call your attention to the positiveness with which this board and these gentlemen of scientific life and experience have asserted the absolute inertness of saccharin, so far as regards any evil effect upon human health. I desire to call your honors' attention to the fact that the pure-food law was created for the purpose, not, as Secretary Bonaparte said, to prevent the people from being fooled, and secondly to protect their stomachs, but first to protect their stomachs and secondly to prevent their being fooled. The honorable Secretary was in decided error; his cart was before his horse. The pure-food law is to protect our health primarily, and I submit to you gentlemen that an investigation of sugar, of pepper, of salt, of vinegar, and of a dozen other things that we use daily, would produce a condemnation greater than that which appears in this report as against saccharin. No one of you gentlemen will dare to consume an equal quantity of sugar with the gram and a half of saccharin that these men took through periods of 30, 40, and 50 days, without the slightest effect in any way. It would be the consumption of 5 pounds of sugar per day, and in three days you would be in the hands of your physicians. Sugar is more deleterious and poisonous, sweetener for sweetener, than saccharin.

Now, it is certainly true that, charged with the most important duty of passing upon a subject as great as this one, that you gentlemen desire to know all that goes to determine whether or no saccharin should be eliminated as a poison, or whether, if it is not a poison, there can be such a regulation made as will permit its reasonable use for the benefit of the general public. My friend Mr. Hough referred to the press campaign on the part of the sugar people. I desire to submit to you gentlemen this proposition: Suppose 50,000 pounds of saccharin were consumed in the course of a year in this country in the sweetening of foods, a very small comparative amount. Being 500 times sweeter than sugar, that would be equal to the consumption of 25,000,000 pounds of sugar, and, at 8 cents a pound, it means that it would take out of the pockets of the Sugar Trust \$2,000,000. It is worth while to conduct a newspaper campaign against saccharin if they can save \$2,000,000 or one-half that amount.

But I am well assured, and my friends are well assured, from the very fact that you gentlemen have permitted this hearing and given us this opportunity, that it is your desire to arrive at what the absolute scientific facts are in this matter and to grant to this saccharin all that it is entitled to. We believe that the report of the Referee Board absolutely acquits saccharin of any poisonous or deleterious effect. We believe that the report of the Referee Board is of such a nature as to thoroughly authorize, and more than that, gentlemen, to demand from your hands a regulation permitting the use of saccharin under proper restrictions. They have defined in this report a small dose and a large dose. The small dose of saccharin was 0.3 gram per day; the large dose ranged from 0.75 gram to 1.5 grams. I desire to call your attention to the fact that no experiments were made in between the 0.3 gram and the 0.75 gram, and yet the food-inspection decision seems to limit positive safety in saccharin at 0.3 gram, and then you follow this by saying that it is poisonous and deleterious where it is used in greater quantities, especially if used in a gram or more. Even that statement is not borne out by the Referee Board's report.

Secretary MACVEAGH. What is the equivalent to 0.3 gram in sugar?

Mr. HAMILTON. Five and a fraction ounces of sugar and, Mr. Secretary, that means about 15 or 16 of the square lumps of sugar that we customarily put in our coffee in the morning; about 16 of those will weigh 5 ounces.

Secretary MACVEAGH. That is your voluntary use. There is, of course, an involuntary use if it is used in other foods.

Mr. HAMILTON. Yes, sir. Now, these tests were made and I beg your honors to appreciate that I make these excerpts from this report because I do not believe it is possible for you gentlemen to read this report through. I do say that it is gathering the cream from the whole thing and therefore it is what must more especially go to your minds.

(Mr. Hamilton at this point read extracts from a typewritten brief, a copy of which is attached hereto, marked "Exhibit A.")

And, gentlemen, we would rest our entire case upon the report of this board; we believe it absolutely sustains us in asking you to promulgate a food-inspection decision or a rule that shall permit the use of saccharin under such proper restrictions as you may be advised by the scientists are necessary. We do not want to use it in such quantities that any man by what he may eat or drink can obtain within his system 0.3 gram a day, and that amount is absolutely innocuous, as the report sets forth. And to that end I have prepared what I had in mind would cover it. I would be pleased to submit this to you gentlemen to read and also this copy of a suggested form

of food-inspection decision, which we believe would be entirely safe and fair.

(Copy of the suggested form of food-inspection decision is hereto attached, marked "Exhibit B.")

Mr. HOUGH. I would like to say, with reference to the question asked by Secretary MacVeagh as to the action in Germany, that the privy councilor of the University of Wurzburg, at the request of the imperial sanitary department of Berlin, made extensive investigations on this subject, the results of which are printed in *Archive für Hygiene*, volume 10.

(Mr. Hough read extracts from this publication and stated that he would submit it in the form of a brief in a few days.)

Thus it would appear that according to the sense of the competent, both in this country and in Europe, this substance is not a poison, and is not in any way injurious to health any more than any other article which might be consumed by man as a food, all of which, if taken in excessive quantities, will produce the same, if not worse, symptoms than can be attributed to saccharin.

Secretary MACVEAGH. Who instigated this experiment?

Mr. HOUGH. At the request of the imperial sanitary department of Berlin. As I understand it, if they had not found that saccharin was perfectly harmless they would not have recompensed the manufacturers. If they had found it was a poison they would then have been justified in prohibiting its use without any recompense. But they found it was perfectly harmless, and therefore did not prohibit it without recompense.

Mr. JOHN F. QUEENY. That report was made for that purpose.

Mr. HOUGH. The German report which resulted in the finding of this was called for by the Government for the purpose of determining whether they should be compensated or not.

Secretary NAGEL. As long as the question has been raised, I should like to ask you a similar question as to our own country. How many States have enacted laws with respect to saccharin; in what proportion has the use of saccharin been prohibited; and in what proportion has legislation been directed to the control and the use of saccharin; and within what period has the legislation been had?

Mr. HOUGH. My understanding is that action has been taken in but two States, and the action that was taken——

Secretary MACVEAGH. What States?

Mr. HAMILTON. There are 15 or 18 States, but that action has all been taken, with the exception of one or two, since the 1st of May last. I have written to the pure-food board of each State or State commissioner of health.

Secretary NAGEL. Do I understand that in 15 to 20 States action has been taken, all since last May?

Mr. HAMILTON. I think all, with the exception of two or three States.

Mr. HOUGH. That was based on the report of the Referee Board that it was a poison and deleterious to health.

Mr. HAMILTON. The city of New York quite recently, Mr. Secretary, took action. I can give you a statement from my office on that point.

Secretary NAGEL. Is this legislation absolutely prohibitive, or is its purpose to regulate and control?

Mr. HAMILTON. I will send all of that to you at once.

Secretary NAGEL. I simply asked the question because so much had been said about the policy of other countries, and I was interested to know the policy of this country.

Mr. HAMILTON. I may state, if permitted by the board, that this last spring the board of health, Dr. Lederle, of New York, took up this question. He said he would await a final determination of this board, but for some reason or other in the month of August, in the absence of Dr. Fries abroad, Dr. Lederle called up my office, and I also was abroad, and he directed the passage of the resolution through the board inhibiting or prohibiting saccharin in its use in New York City within certain limits. I was told yesterday by a member of his staff that he greatly regretted having done so and was sorry that he did not wait until he could talk with some one who had knowledge of the question before that action was taken, and I think similar action has been taken in many of the States, based on the food-inspection decision.

Mr. QUEENY. In Louisiana, where they raise sugar, and there are one or two States in the far West where the use of saccharin was prohibited up to this year. A great many of the States have pure-food laws based entirely on the Federal law and with the provision that all regulations that will be issued by the Federal Government shall be followed by the State commissioner. Consequently, when the regulation was promulgated prohibiting the use of saccharin, the State commissioners immediately took action and prohibited it. However, in Missouri and Nebraska the soda-water bottlers were a little more busy than other States, and they had special legislation passed prohibiting the use of saccharin in soft drinks. That applied principally to Missouri and Nebraska, but most of the other States—Georgia and down through all of the South and West—most of them have that provision in their State law which requires the State commissioner to follow all regulations that will be promulgated by the Federal Government. That is why so many States prohibited the use of saccharin. It has not been specially legislated against except in a few, but by reason of the State law requiring them to follow the Federal regulations.

Dr. FRIES. Mr. Hamilton mentioned Dr. Lederle, and for his sake I wish to say that last May, after returning from the hearing, I spoke to him and he desired that the city of New York should follow the Federal regulations, and I said that the Referee Board's decision had not been seen by any of us and if he would only wait for a short time until it appeared he would understand the situation very much better. He called up one or twice and asked for it and it was impossible to explain that we did not have it and had not seen it, and I dare say that he waited until about August or September and then came to the conclusion that he had to act, and that is the cause of Dr. Lederle not holding over until we could give him a further decision, largely on account of not receiving the Referee Board's decision.

Secretary NAGEL. Inasmuch as you propose to file briefs, it seems to me only fair to say, for my part at least, what are the difficulties that I encounter, and I suppose every Secretary has his own difficulties as I am willing to admit mine. There appears to be some little misunderstanding as to the conditions under which the first order was made by the secretaries. When I signed that order I did have the recommendation of the Referee Board, or the findings of the Referee Board, before me, and as I understand it, that finding, that is, the conclusion, has not been modified; it stands to-day. For my part I regard the conclusions arrived at by the Referee Board as virtually conclusive upon me, so that I have no regrets about the original order signed by the secretaries.

When the first hearing was had, the application was for time. I felt then, as I feel now, that where the law has made a clear declaration of condemnation and the manufacturer persists in disregarding the law, no authority should hesitate about confiscating. But where the law has been in doubt and the manufacturer has continued under the impression that his product is a legitimate one, I thought all authority should move with caution and should avoid unnecessary loss, especially if the report against the product is not clean-cut and clearly condemnatory. That was the reason for my position before, and it would be my position now if the same question arose. That question, however, has been disposed of; and we now have to deal with the propriety of the order which we signed upon the strength of the conclusions reported to us by the Referee Board. I do not feel that I am capable of examining the whole report, and reading the conclusions in the light of that report I think I shall have to accept the conclusions plainly given, just as I would accept a decree if I were an executive officer; and the question is, what are those conclusions? Now, that phase of it, of course, will be particularly interesting for treatment in your brief, as far as I am concerned. The board does say saccharin in large quantities (over 0.8 gram per day, and especially above 1 gram daily), if taken for considerable periods

of time, is liable to disturb digestion. A proper question is, and to it I should be glad to have you direct your attention, what agencies have we to make a discrimination in the quantity to be used, which the conclusions of the Referee Board apparently contemplate? Of course poisons are permitted, but they are regulated by the provision that they shall be sold only on prescription of a physician. Conceding your argument that saccharin is not a poison, the conclusion urged here by the Referee Board is that saccharin used in certain quantities is injurious to health.

Mr. HAMILTON. Not quite that, "is liable to produce disturbance."

Secretary NAGEL. Well, we will not quarrel about that. The proper question is, if it be true that used in small quantities it is safe, and used in larger quantities it is unsafe, what provision is there in the law to enable us to formulate a rule to cover that situation? Now I would be very glad to be assisted in that respect.

The second conclusion is that the addition of saccharin to food as a substitute for cane sugar or some other form of sugar must be regarded as a substitution involving a reduction of the food value of the sweetened product, and hence a reduction in its quality. Now, to repeat, I have nothing to do, as I read it, with the manner in which that conclusion was reached. I am frank to say that if the quantity of sugar producing the same amount of sweetening is as 500 to 1, I have some difficulty in concluding that the food value could be reduced by the use of saccharin. I do not know whether it is true or not, but here is the conclusion. I regard that as binding upon me and I do not quite see how you are going to answer that conclusion.

Mr. HAMILTON. May I ask whether you conceive it to be part either of the authority of the pure-food law or of this board to prohibit any but absolutely the first quality of flour, and everything else that is used? Suppose that it does diminish the food value and is stated on the package, is there any authority vested here, or does the law give any authority to anybody in this country to say we shall not sell that, if it is not detrimental to health?

Secretary NAGEL. I shall be glad to have you present that in your brief. I am only endeavoring to state to you what doubts I have in my mind because I see very little advantage in an argument unless those who listen to the argument are prepared to say what is in their minds. In that fashion we may be able to get at a conclusion and state our conclusion finally in such a way that it will be of some satisfaction to you. Ultimately, perhaps, the advantage of the present situation is that you have a case by means of which can be very clearly presented to a court the question of our authority for making the order upon the strength of the report of the Referee Board. I have sometimes thought that that would be the easiest way

out of it, because it would test once for all the propriety of our action. I am not endeavoring to state any conclusion at all; I am endeavoring to frankly tell you what is in my mind.

Mr. HAMILTON. On my part, I thank you. In the brief which we will prepare we will endeavor to cover all points and show how it is possible to come within the rule laid down by the Referee Board as to the amount which is absolutely harmless. Of course the addition of saccharin to foods does not change or alter the quality or value of the food to which it is added; that is in the statement.

Secretary NAGEL. I may add that I had some difficulty in reconciling those two statements.

Mr. HOUGH. But the strong point we made was that if a board to which has been referred this question says here is a substance which in certain amounts is not a poison and that its addition to foods does not change or alter the value of the food, that should not be absolutely prohibited. If we realize that what they say against it can be said with even greater effect against numerous articles of food which no one ever thinks of calling poisonous, we appreciate the true effect to be given it.

Secretary NAGEL. That argument is not conclusive, because if we had a report like that on sugar we might have to condemn it.

Secretary MACVEAGH. You want to remember the third clause in the conclusions of the Referee Board, which deals with the question of substitution, and do not fail to make your position clear on that point, because the case might turn wholly on that.

Mr. HOUGH. I did not elaborate this point in my opening statement, but endeavored to cover it by saying that if you do not explain the use where there is a substitution it can then be regarded as a lowering; where the use is stated, then it can not be regarded as a lowering. That also meets the suggestion that is made by Mr. Hamilton, and we will endeavor to make that as clear as possible in our brief. When it is the consensus of opinion of the competent as to effect that it is not injurious, then such an article should not be prohibited altogether.

Secretary MACVEAGH. If it is a substitution, no matter whether it is a poison or not, it is a question whether it is not prohibited absolutely.

Secretary WILSON. I want to give you a little more work; you may run out of a job: 0.3 gram is reported by the Referee Board to be safe; there are between 30 and 40 foods in which it can be used, food that sweetening is applied to; look into the question of the danger of getting more than the 0.3 by a combination of these foods.

Mr. HOUGH. Unquestionably; we thought of that, but it is a physical impossibility for a man to put so much in his stomach.

Secretary WILSON. I want your mature judgment on that point, because it is one that has lodged in my mind and must be removed, if it can be.

Mr. HAMILTON. May we ask that you direct your Department of Chemistry to give us a list of those foods? Here are two of the largest manufacturers of saccharin, and they say they have no knowledge of any such use whatsoever.

Secretary WILSON. That is your job. Are you going to ask me to work on your side?

Mr. HAMILTON. We will have to send an official request to you to give us a list of the foods. We know 10 or 12 foods; now when somebody else says 30 or 40, we want to know what they are.

Secretary NAGEL. Aren't we dealing with the possibility of abuse in the use of saccharin? Conceding that it is only used in two articles, that runs into the first question as to our inability to control within safe restrictions.

Mr. HAMILTON. I understand the Secretary's remark to be that if it is used in certain foods that contain natural saccharin, whether or no the addition of a certain percentage—

Secretary WILSON. No; you have not got me right.

Mr. HOUGH. I think the Secretary means that if it is used in 30 or 40 foods and one man will eat each of the 30 or 40 in a day, he may thus get more than the 0.3 gram in a day.

Mr. HAMILTON. I am very pleased to be able, when we make our brief, to be able to refer to, day after day, to sometimes 25 different foods that the men ate, and each one can be determined whether it contained saccharin or not. There is no sweetening in meat or in pork—

Secretary WILSON. You are going fast. There is sweetening put into meats; of course there is cured meat, and a man may eat some of this; and suppose you do not put sugar in, but put in saccharin.

Mr. HAMILTON. Well, pork chop would hardly be called a cured meat, would it?

Secretary WILSON. I think it is fair that I should state it.

Mr. HOUGH. If a regulation can not be made which makes it impossible for a man to get more than a safe amount, then the regulation should not be made. If it is possible to make the regulation, then the destruction of the manufacturing should not be decreed.

Mr. HAMILTON. We might ask how much time we have in which to file our brief?

Dr. FRIES. I have been the original manufacturer of saccharin in this country, and I have gone over the question of 30 or 40 foods, and I can not find them.

Secretary WILSON. I am going to ask these two gentlemen, the secretaries here, that we appoint somebody to prepare a statement on

the other side, and if you gentlemen do not deal with this, whomsoever we appoint may. It is only fair that the other side should be presented in this hearing.

Mr. HAMILTON. There is no objection.

Mr. HOUGH. We would only like to have an opportunity to reply to anything said on the other side.

Secretary WILSON. You are going to get abundant opportunity.

Mr. HAMILTON. When can we send in our brief?

Secretary WILSON. You can send your brief in whenever you get ready.

Mr. HOUGH. We may find that we disagree with some of the conclusions reached by the Referee Board, or we may find some difficulty in harmonizing some of the statements, but I premised my remarks upon the proposition that we proposed to stand on the report of the Referee Board. Therefore, I do not think we should go back, or anybody should go back, of the conclusions as stated in the Referee Board's report. It seems to me the only question is, Can a regulation be made within the report of the Referee Board which would so limit the use as to make it impossible for a man to take a larger amount than is safe?

Secretary WILSON. We want that in writing; put these remarks in writing.

Mr. HAMILTON. If you do obtain a brief or a statement in opposition to what has been said to-day, may we have copies of it?

Secretary WILSON. I see no objection to that at all. Everything will be fair.

Mr. QUEENY. All we want is a fair ruling.

Secretary WILSON. You would not have been here at all to-day if it had not been out of a wish to give you a fair ruling.

Secretary MACVEAGH. Your point of the way to safely limit the use—practically limit the use—of saccharin within certain limits, your statement that that is something for you to do, is correct. That we want you to do, and I repeat that that is not all.

Mr. HAMILTON. You mean I am also to meet that paragraph in the third part of their report?

Secretary WILSON. That is a very difficult thing for me to get over.

Adjourned.

EXHIBIT A.—BRIEF OF SACCHARIN MANUFACTURERS UPON REPORT NO. 94, INFLUENCE OF SACCHARIN ON THE NUTRITION AND HEALTH OF MAN, REFEREE BOARD OF CONSULTING SCIENTIFIC EXPERTS.

The SECRETARY OF AGRICULTURE,

The SECRETARY OF THE TREASURY,

The SECRETARY OF COMMERCE AND LABOR,

Being the officers charged under section 3 with the duty of making uniform rules and regulations for carrying out the provisions of the food and drugs act of June 30, 1906.

Representing an invested interest on the part of American citizens of approximately \$1,000,000, and employing nearly or quite 500 other American citizens in the manufacture and sale of saccharin throughout the United States under and by virtue of the laws of the United States, we most earnestly and respectfully submit that the full and exhaustive report now before you from the Referee Board of Consulting Scientific Experts upon the influence of saccharin on the nutrition and health of man does not sustain the existing food inspection decisions, Nos. 135 and 138, and that the same should be at once modified to conform to the facts and conclusions appearing in said report.

To sustain this contention we submit the following data from the pages of the report in question:

I. A "small dose" of saccharin was up to 0.3 gram per day. A "large dose" ranged from 0.75 grams to 1.5 grams per day.—Rept., p. 7.

II. Conclusions of board:

Saccharin in small quantities (0.3 gram per day or less) added to the food *is without deleterious or poisonous action and is not injurious to the health of normal adults*, so far as is ascertainable by available methods of study.

Saccharin in large quantities (*over 0.3 gram per day and especially above 1 gram daily*) added to the food, if taken for considerable periods of time, *especially after months*, is liable to induce disturbances of the digestion.—Rept., p. 8.

DATA.

Subject: I K.

Dose: From 0.3 gram to 1.5 grams.

Length of test: 129 days. Age, 25 years.

Summary:

The most careful consideration of the conditions in this case from every available point of view failed to develop any evidence that the disturbances of health above mentioned were connected with the taking of saccharin.—Rept., p. 15.

The conclusion that I reached was that the disturbances noted were probably in no way connected with the intake of saccharin.—Rept., p. 16.

Subject: II O.

Dose: From 0.3 gram to 1.5 grams.

Length of test: 164 days. Age, 44 years.

Summary:

Thus, despite this slight and occasional disorder (headache and digestive disorder), the subject may be regarded as having passed through the saccharin periods without the tenor of his health having being influenced.—Rept., p. 16.

Subject: III N.

Dose: From 0.3 gram to 1.5 grams.

Length of test: 153 days. *Age,* 29 years.

Summary:

No disturbances whatever were reported throughout the entire period of the experiment.—Rept., p. 16.

The nutritional state of the subjects as measured by changes in *body weight* was not impaired by the saccharin taken with the food.—Rept., p. 16.

The variations as shown (pulse, respiration, and temperature) were all within the normal limits. The variations in the average for the two periods were too slight to have any significance.—Rept., p. 18.

The fuel value of the food ingested by the subjects during the period covered by the experiment has been estimated and recorded in terms of large calories. The results are seen to remain fairly uniform throughout, indicating but slight variations from week to week in the amounts of fats and carbohydrates ingested.—Rept., p. 20.

The men took the saccharin in tea, coffee, and in water, and not infrequently it was taken with certain foods whose flavor would not be particularly impaired by being sweetened.—Rept., p. 21.

As to the effect on appetite and the amount of food ingested, the report says:

The figures taken together, however, fail to show any specific effects due to the saccharin upon the total amount of food ingested day by day.—Rept., p. 23.

The board reports as to the effect upon urine:

The volume is in no way connected with the ingestion of saccharin.—Rept., p. 27.

The fluctuation as to specific gravity is irregular and does not bear any relation to the dose of saccharin.—Rept., p. 28.

The total output of saccharin as estimated by chemical analysis during the whole period in the case of Subject I K was 100.1 per cent of the saccharin ingested; in Subject II O, 102.5 per cent; and in Subject III N, 93.1 per cent. These results indicate a certain degree of individual variation.—Rept., p. 37.

This greater ingestion of nitrogen and diminished loss in the feces seem to be associated with a slight improvement in the general condition rather than any specific action of the saccharin, and probably bear no perceptible relation to the use of saccharin.—Rept., p. 40.

The varying dosage of saccharin had no evident influence upon the amount of ammonia nitrogen excreted in the urine.—Rept., p. 41.

There is no evidence that the taking of saccharin in the dosage given appreciably affected the amount of uric acid in the urine.—Rept., p. 42.

The normal relation between the nitrogen of ammonia and uric acid and the total nitrogen of the urine is therefore apparently not affected by the taking of saccharin.—Rept., p. 43.

The results thus appear to be negative so far as any influence of saccharin is concerned [sulphur in urine].—Rept., p. 46.

The conclusion is therefore drawn that the saccharin is without influence on the output of inorganic ethereal and neutral sulphur in the urine.—Rept., p. 48.

It seems most probable, therefore, that the saccharin taken by the subjects had no disturbing influence on the relative excretion of the nitrogen and sulphur.—Rept., p. 62.

A few calcium oxalate crystals were regularly found in the case of each subject. These were no more frequently present during the saccharin periods than during the weeks when no saccharin was taken.—Rept., p. 67.

The board reports as to the effect upon feces:

It is evident that the administration of saccharin in the dosage used had no specific influence on the weight of the moist feces.—Rept., p. 67.

In the dosage of 0.3 gram and 0.5 gram of saccharin daily there was no appreciable alteration in the acidity of the feces.—Rept., p. 76.

All these changes in the amounts of indol and skatol in the feces are within normal limits.—Rept., p. 83.

The saccharin had no obvious effect upon the intensity of the reaction for hydrobilirubin, as there were no distinct variations during the different periods of the experiment.—Rept., p. 83.

The amount of hydrogen sulphide in the feces of all the subjects throughout the experiment was well within normal limits.—Rept., p. 83.

There was a slight lessening of the relative amount of nitrogen lost in the feces during the time that saccharin was taken.—Rept., p. 85.

The fluctuations in the nitrogen balance are not sufficiently marked to be of significance. They indicate that the use of saccharin did not lead to a loss of bodily nitrogen.—Rept., p. 87.

The board reports upon clinical and microscopical examination:

A study of the results of the analyses of the gastric contents in the three subjects justifies the conclusion that in these experiments saccharin produced no constant change on the secretions or motor functions of the stomach.—Rept., p. 88.

The board reports as to effect upon the blood:

The conclusion to be drawn from the study of the blood of these subjects is, therefore, that saccharin in this series of experiments had no influence on the blood in respect to its hemoglobin content, the number of red cells, the number of leucocytes, or the differential count of the white cells.—Rept., p. 90.

Two "approximately normal" subjects were experimented upon from March 2 until April 30, taking from 1 gram to 1.5 grams of saccharin each daily. Upon this the board reports:

Subject H. E. D., 26 years old. Taking of saccharin had apparently but little effect upon his bodily weight. His appetite remained good, and he slept well. His pulse fluctuated within normal limits and was of average tension. He thought the experiment had made no change at all in his condition.—Rept., p. 94.

Subject J. W. D., 21 years old. Weight remained fairly constant during the experiment. On March 28 developed a cold with headache, pain in the back, weakness in the legs, constipation, and sore throat. His appetite, however, remained good, and he slept well. It seems improbable that saccharin was a factor in this disturbance. At the close of the experiment the subject reported that he was "feeling fine," which was borne out by his general appearance. He reported having slept well and having no headache. His older brother said at the close of the experiment that he had never known him to be so well, nor his skin so clear, and remarked that other members of the family made the same observation.—Rept., p. 94.

Apparently the taking of saccharin exerted no influence upon the composition of the urine in either of the cases reported.—Rept., p. 95.

The examination of the blood included the estimation of the hemoglobin and the number of red blood cells and white blood cells per cubic millimeter. None of these revealed any abnormalities.—Rept., p. 99.

The rise in the free hydrochloric acid is distinct yet does not apparently exceed the extreme physiological limits of health.—Rept., p. 99.

In a study made and reported by the board in a case of hyperchlorhydria they report:

In conclusion it may be said that, both from the testimony of the subject in regard to his condition and from the results of the physical examination, no deleterious effects could be attributed to the ingestion of saccharin.—Rept., p. 101.

As to the influence of saccharin upon digestive enzymes the board says:

It must be conceded that the effect of the presence of the sodium salt of saccharin upon the action of the salivary enzymes is very slight.—Rept., p. 106.

No evidence was obtained of any specific action of the saccharin upon the salivary enzymes.—Rept., p. 108.

The beneficial effect of the saccharin upon the action of the peptic enzyme is doubtless to be ascribed to the acid character of the substance.—Rept., p. 112.

In no case did the addition of saccharin in such concentration as might result from its use for the sweetening of food result in any material modification of the course of peptic digestion.—Rept., p. 113.

An examination of the figures contained in Tables 60, 61, and 62 show that the sodium salt of saccharin exerts no material influence upon the hydrolysis of casein by trypsin unless present in concentrations infinitely greater than could ever occur in the actual use of the substance for dietetic purposes.—Rept., p. 116.

It is inconceivable that the employment of saccharin for the purpose of sweetening food could ever result in the duodenal contents possessing a saccharin concentration approaching these limits. (Table 64, p. 117.) It may be safely concluded, therefore, that the action of lipase in effecting the hydrolysis of fats is not significantly affected by the presence of the sodium salt of saccharin in amounts materially greater than those that might result from its employment for the purpose of sweetening food.—Rept., p. 118.

Such concentrations as these (Experiment IV, Tables 65, 66, pp. 119–120) are infinitely greater than any that could result from the dietetic employment of saccharin for the purpose of sweetening food. The lower concentrations of the sodium salt of saccharin used in the other experiments recorded in Tables 65 and 66 had no material effect upon the action of the pancreatic enzymes.—Rept., p. 120.

The saccharin after neutralization exerts no material influence upon the action of the pancreatic enzymes upon starch even when present in considerably larger amounts than those which could possibly be present as the result of the use of saccharin for sweetening purposes.—Rept., p. 122.

The board found the influence of saccharin beneficial rather than otherwise upon microorganisms:—

It was observed that the effect of 0.2 per cent of saccharin, when neutralized by ammonium hydroxide, is very slight in an inhibitory direction on *B. coli communis*.—Rept., p. 122.

In concentrations of 0.18 per cent of saccharin there appears to have been a slight inhibition in gas production of the paratyphoid organism, but even with 0.3 per cent of saccharin the inhibiting effect remains small. In the case of *B. cloacæ* 0.095 per cent of saccharin sufficed to cause a considerable fall in gas production.—Rept., p. 123.

In a special discussion of all the data before it as to the effect of saccharin upon digestion the board says:

The sodium salt of saccharin even in much greater concentrations than that which might be employed for sweetening food, had no material influence upon the action of the enzymes of the saliva and pancreatic secretions concerned with the hydrolysis of starch.—Rept., p. 129.

The sodium salt of saccharin, *even in much greater concentration than that which might be employed for the sweetening of food* had no material influence upon the action of the tryptic enzyme of the pancreas upon casein or of the lipoclastic enzyme of the pancreas upon olive oil.—Rept., p. 130.

In no case was any evidence obtained of any specific inhibiting action upon enzymes of saccharin or by its sodium salt. *Such quantities of these substances as might be employed for the sweetening of food are unlikely to affect the normal physiological activity of the digestive enzymes.*—Rept., p. 130.

No evidences of gastric disturbance clearly referable to saccharin were noted during the period of feeding with small doses of 0.3 gram of saccharin daily, and it appears unlikely that such doses *even when long continued* are the occasion of clinical manifestations of disturbed gastric digestion.—Rept., p. 130.

There is little to be said in regard to the effects of saccharin upon processes of metabolism. Our work indicates that *no significant deviation in nitrogenous metabolism is brought about through the action of saccharin even in considerable doses.*—Rept., p. 133.

FINALLY.

From Dr. Herter's experiments the board deduces the following summary:

I. Saccharin in small doses (up to 0.3 gram daily) caused no disturbance of any kind, either as ascertainable by clinical investigations or through laboratory study of digestion or metabolism by modern methods.

II. Saccharin in large doses (1 to 1.5 grams daily) was observed to be followed by certain modifications of physiological conditions. These were not of constant occurrence and were not all observed in any one subject. They were apparently caused by the use of saccharin.

In the one case of hyperchlorhydria and the one instance of hypochlorhydria in which the action of saccharin was tested there appeared to be no greater susceptibility to its action than in cases in other respects more normal.

An investigation of the influence of saccharin upon the action of the enzymes, concerned with starch hydrolysis, present in the saliva and pancreatic secretion, shows that the inhibiting action of saccharin is no greater than that of hydrochloric acid of equal molecular concentration. There is no evidence of any specific inhibiting action of saccharin upon these enzymes.

The sodium salt of saccharin, *even in much greater concentrations than that which might be employed for sweetening food*, had no ma-

terial influence upon the action of the enzymes of the saliva and pancreatic secretions concerned with the hydrolysis of starch.

An investigation of the influence of saccharin upon the peptic digestion of egg albumin in the presence of hydrochloric acid showed that *concentrations of saccharin, such as might be employed for sweetening food, had no material influence upon the activity of the peptic enzyme.*

The sodium salt of saccharin, *even in much greater concentrations than that which might be employed for the sweetening of food*, had no material influence upon the action of the tryptic enzyme of the pancreas upon casein or of the lipoclastic enzyme of the pancreas upon olive oil.

In no case was any evidence obtained of any specific inhibiting action upon enzymes by saccharin or by its sodium salt. *Such quantities of these substances as might be employed for sweetening food are unlikely to affect the normal physiological activity of the digestive enzymes.*

From a consideration of all the data bearing on the subject of the action of saccharin we have reached the conclusion that relatively large doses of saccharin (over 0.3 gram, and especially above 1 gram daily) if continued for considerable periods of time (months) are liable to induce disturbances of digestion. On the other hand, small doses of saccharin (0.3 gram or less) may be taken daily during long periods of time (months) by normal adults without any detriment to health ascertainable by the available methods of study.

No evidence was attainable that the addition of saccharin to the food altered the quality or strength of the food. On the other hand, it is obvious that if saccharin be added to the food with intention of replacing glucose or some other foodstuffs, this must be regarded as a substitution involving the reduction of the food value of the sweetened product, and hence as a reduction in its quality.

The board has seen fit to submit with its report abstracts upon the literature of saccharin throughout the world, a number of scientists being cited. From these we quote:

Satkowski (1886) after many tests finds that saccharin is not a poison; has no action on gastric digestion; does not increase protein metabolism; has no effect upon starch digestion, either salivary or pancreatic; has no effect upon intestinal digestion; inhibits pepsin digestion far less than Mosel wine, or than the same sweetness of sugar solution.

Worms (1888) tried saccharin upon many patients without any bad effects whatever.

Constantin Paul (1888) found saccharin to inhibit ferment action.

Neumann (1901), after careful experiments stated that saccharin had no effect either on the general condition or protein metabolism.

Berlitz found saccharin inhibited digestion hardly at all and less than the equivalent amount of sugar.

Keller (1898) found by experiment that no effect, good or bad, resulted from saccharin. Preferred saccharin to sugar for sweetening, as it produced no diarrhea. That with babies all the sugars increase the ammonia excretion in the urine, which does not happen when saccharin is used as a sweetener. Concludes saccharin may better be used instead of sugar as a sweetener for babies' foods.

Jessen (1890) found no effect from many experiments with saccharin.

Gans (1889) found that saccharin had no bad effect upon the peptic digestion. That it prevented pulrefaction.

Petschek and *Zerner* (1889), after a series of experiments, found as conclusions: That saccharin had no effect on gastric digestion and that it had no ill effects upon the human system. Useful as a sweetener.

Hofmeister (1890) says: "I have never known it to be injurious either to digestion or in any other way."

Kuhn (1892) found saccharin to have a strong inhibiting effect upon fermentation.

Nencki (1899) found that the alcohol in ordinary wine disturbed digestion more than the amount of saccharin ordinarily used in food.

Stift (1898) believes saccharin to be harmless.

Otto Folin, of Harvard University, supplies the board with a résumé and conclusions as to the effect of saccharin upon the health, nutrition, and general metabolism of men.

Basing his conclusions upon experimentation on twelve young men from the Harvard Medical School for a period of about five months, during which time saccharin was taken at every meal in quantities ranging from 0.15 gram to 0.75 gram per day, he says:

Considering the number of men involved, the length of the experiment, and the amounts of saccharin given, the negative character of the results obtained indicate that, so far as can be ascertained with methods at present available, saccharin in moderate doses is not injurious to the health of normal, sound adults.—Rept., p. 234.

[Signed]

FRANCIS E. HAMILTON,
Counsel for Sac. Mfg. Co.

NOVEMBER 21, 1911.

EXHIBIT B.—SUGGESTED MODIFICATION OF FOOD INSPECTION DECISIONS ON SACCHARIN IN FOOD.

Food Inspection Decisions 135 and 138 are hereby modified to read as follows:

The investigations of the Referee Board of Consulting Scientific Experts have been concluded as to the effect upon health of the use of saccharin. The summary of the same is as follows:

(1) Saccharin in small quantities (0.3 gram per day or less) added to the food is without deleterious or poisonous action, and is not injurious to the health of normal adults, so far as is ascertainable by available methods of study.

(2) Saccharin in large quantities (over 0.3 gram per day, and especially above 1 gram daily) added to the food, if taken for considerable period of time, especially after months, is liable to induce disturbances of the digestion.

The Secretary of Agriculture therefore will regard as adulterated under the food and drugs act preparations for food consumption containing saccharin in any greater quantity than one-fiftieth of 1 per cent which after May 1, 1912, are manufactured or offered for sale in the District of Columbia or the Territories, or shipped in interstate commerce, or offered for importation into the United States.

In all preparations for food consumption where saccharin is used the fact shall appear upon the label, together with a statement that the quantity does not exceed one-fiftieth of 1 per cent.

[Signatures of three Secretaries.]

**BRIEF BY FRANCIS E. HAMILTON, ATTORNEY AND
COUNSELOR AT LAW, NEW YORK CITY.**

The report of the Referee Board of Consulting Scientific Experts holds:

A small dose of saccharin is up to 0.3 gram per day.

Saccharin in small quantities (0.3 gram per day or less) added to the food is without deleterious or poisonous action and is *not* injurious to the health of normal adults, so far as is ascertainable by available methods of study.

Saccharin in large quantities (over 0.3 gram per day, and especially above 1 gram daily) added to the food, if taken for considerable periods of time, especially after months, is liable to induce disturbances of the digestion.

The admixture of saccharin with food in small or large quantities has not been found to alter the quality or strength of the food. It is obvious, however, that the addition of saccharin to food as a substitute for cane sugar or some other form of sugar must be regarded as a substitution involving a reduction of the food value of the sweetened product, and hence as a reduction in its quality.

From the above three separate conclusions are manifest:

First. Saccharin may be used in quantities of 0.3 gram per day without risk or effect upon the health.

Second. Saccharin, if mixed with food, does not alter its quality or strength.

Third. If saccharin is used as a substitute for sugar, it diminishes by just so much the food value of the product, in that the food value, whatever it may be, of the eliminated sugar is lost.

The Board of Three Secretaries desire light upon the following questions:

First. How can the use of saccharin be limited to 0.3 gram per day in the various and divers foods eaten by the public?

Second. If the substitution of saccharin for sugar makes a loss of the food value of the sugar, is it lawful to permit its use?

In order to properly consider the first question it becomes necessary to determine how much food is consumed daily by the average normal adult.

From the records contained in the Referee Board's report, covering a period of 447 days—about one year and three months—it is found

that the daily normal average of food consumption by the vigorous young men used as subjects amounted to 2,432 grams, including all liquids except drinking water. This is about 5.35 pounds, and of this quantity the liquids milk, tea, and coffee constituted about 38 per cent.

As the use of saccharin in milk, tea, or coffee must be governed by the individual and can not be fixed by the manufacturer or seller of milk, tea, or coffee, it is apparent that the actual quantity of food in the average daily consumption of adults which could be affected by the addition of saccharin would be about 1,508 grams, or about 3.33 pounds.

This is a liberal allowance and is sustained by all the authorities available. The British Encyclopedia shows that averaging 1,000 cases drawn from English, Russian, Swedish, Bavarian, and American working men, the daily consumption of food was, aside from drinking water, 1,007 grams.

The statistics of the Smithsonian Institution give the daily normal consumption of food and drink as approximately 6 pounds, or 2,718 grams, but this included all water, which is estimated at 37 ounces and if eliminated reduces the average to 1,686 grams.

The standard figures of Prof. Carl Voit are those most generally used and cover only starchy, fat, and albuminous material in amount 680 grams.

In the American merchant marine within the past 10 years a scale of food was adopted which, with all liquids except drinking water, amounted to 2,619 grams daily, or reduced by the Smithsonian scale to 1,624 grams.

The British Navy in its ration allowance, aside from drinking water, gives only 2,112 grams daily—equal to 1,310 grams.

Taking all this data it is therefore a most reasonable conclusion to accept 2,500 grams as the maximum amount of food and liquid—aside from drinking water—consumed by the average normal adult in a day.

The consumption of women, children, and those suffering from illness would naturally be less.

If a regulation were issued permitting the use of saccharin in foods in percentages not in excess of one one-hundredth of 1 per cent, it is seen that if every gram of food and drink, except drinking water, consumed were treated with saccharin, the total quantity ingested could not exceed 0.25 gram, which is a long way on the safe side of the Referee Board's report.

In considering this we must further call attention to the fact that while milk, tea, and coffee constitute at least 800 grams of the 2,500 consumed daily, and that saccharin can not be mingled with these products by the manufacturer or the seller, and are never used

therein except pharmaceutically; for which reason the actual quantity of saccharin in the remaining food would of necessity be but one one-hundredth of 1 per cent of 1,700 grams. This would mean the use of only 0.17 gram of saccharin daily; thus reducing the quantity reported absolutely safe by the Referee Board almost half in amount.

But even yet the basic facts have not been reached. In all of the estimates of food consumption above referred to, fresh meats, fish, potatoes, and eggs form a material part. In the experiments conducted by the Referee Board these three products—beefsteak, chops, fresh pork, mutton, fish, fowl, boiled potatoes, and boiled or fried eggs—average 23 per cent of the sum total of each day's consumption, and it would be a conservative estimate to deduct at least 20 per cent from the total solids ingested as consisting of foods in which it is physically impossible to use saccharin. This would reduce the quantity of 1,700 grams to 1,360 grams, which we may admit, after careful examination, and after comparison with all the data given above, practically represents the daily normal average quantity of food ingested by an adult which could be sweetened with saccharin.

The use of one one-hundredth of 1 per cent of saccharin in this food would mean the consumption by the normal average adult, eating as heartily as it were possible for him to eat, of only 0.136 gram of saccharin daily, or less than one-half the amount which the Referee Board of Consulting Scientific Experts have declared to be absolutely harmless.

The regulation should require the presence of saccharin to appear upon the label, stating that the product contained not more than one one-hundredth of 1 per cent, and any food or product violating would be subject to the penalty of the law.

From the above it will at once be seen that the number of foods in which saccharin is, has been, or may be used does not enter into the discussion. If it were present in *all* prepared foods the quantity ingested could not equal the permitted amount of 0.3 gram per day when its presence is limited to one one-hundredth of 1 per cent in any, every, and all articles of food.

In replying to the second question suggested by the Board of Three Secretaries we submit the following:

Section 7 of the food and drugs act declares a food to be adulterated "if any substance has been mixed or packed with it so as to reduce or lower or injuriously affect its quality or strength."

The question submitted to the Referee Board of Consulting Scientific Experts was:

If saccharin be mixed or packed with a food, is the quality or strength of said food thereby reduced, lowered, or injuriously affected (a) in large quantities, (b) in small quantities?

The reply to the question on the part of the Referee Board is:

The admixture of saccharin with food in small or large quantities has not been found to alter the quality or strength of the food.

This fully and completely answers the question, and asserts with concise positiveness that saccharin "either in small or large quantities" does "not alter" the "quality or strength" of the food.

If it does not alter the strength or quality, it can not reduce, lower, or affect injuriously the food. That may be considered as settled by this reply.

But the Referee Board continues:

It is obvious, however, that the addition of saccharin to food as a substitute for cane sugar or some other form of sugar must be regarded as a substitution involving a reduction of the food value of the *sweetened product* and hence as a reduction in *its* quality.

In other words, if sugar has been added to a food to sweeten it, and subsequently the sugar is withdrawn and saccharin substituted as a sweetener, the "sweetened product"—not the "*food*"—is reduced in food value by just the amount of sugar withdrawn.

This conclusion is correct beyond question, but what has it to do with the pure-food act?

The law forbids mixing or packing with food any substance which shall reduce, lower, or injuriously affect "its" quality or strength; that is, the quality or strength of the food with which the substance is mixed.

The Referee Board has definitely declared that the use of saccharin in either large or small quantities when mixed with foods "does not alter the quality or strength of the food."

That the "addition" of another substance to food is permitted by the act if that substance is not poisonous or deleterious goes without saying, and we search the law and the regulations in vain to find any authority which permits the use of sugar, for instance, as a sweetener of foods, but forbids the use of any other nonpoisonous and non-deleterious substance, as, for instance, saccharin.

If A packs his corn $15\frac{1}{2}$ ounces to the can and adds one-half ounce of sugar to sweeten it, the law permits such packing, and A advertises and sells "sweet corn."

If B packs his corn 16 ounces to the can and adds 0.01 per cent saccharin to sweeten it, the law permits such packing, and B advertises and sells "Sweet corn."

NOTE.—The law condemns neither sugar nor saccharin, and the packer has the right to use either, *but* A supplies less "Sweet corn" than B.

If, however, A having formerly packed $15\frac{1}{2}$ ounces of corn and the one-half ounce of sugar in a can, prefers to drop the one-half ounce of sugar and substitute 0.01 gram of saccharin, he in no wise "*reduces, or lowers, or injuriously affects the quality or strength*" of his corn. He simply eliminates one-half ounce of sugar and adds one-half ounce of corn, and his label tells the public that saccharin is the sweetener.

Sub. Second, under "*In the case of food,*" section 8, food and drugs act, says:

Nothing in this act shall be construed as requiring or compelling proprietors or manufacturers of proprietary foods which contain no unwholesome added ingredient to disclose their trade formulas, etc.

Here is a distinct recognition on the part of the law itself that the foods may contain "added ingredients." One manufacturer may add sugar, another saccharin with equal authority, and if any manufacturer having used sugar as a sweetener decides to change and use saccharin, the same being declared by the Referee Board to be "without deleterious or poisonous action and not injurious to health," and therefore not "unwholesome," we confidently assert that nothing in the act forbids him so to do.

To sum up:

The food and drugs act forbids adulteration—

First. By the mixture of any substance with food "*reducing, lowering, or injuriously affecting*" the "*quality or strength*" of the food.

The Referee Board's report declares saccharin does not alter the strength or equality of the food.

Second. By substituting wholly or in part any substance for the food.

Since the quantity of saccharin to be used is only one one-hundredth of 1 per cent there can be no substitution.

Third. If any valuable constituent "*of the article*" has been wholly or in part abstracted.

Nothing is abstracted when saccharin is used; and if it is used in lieu of sugar, that is and was no "*constituent part*" of the original article.

Fourth. If the food is mixed, colored, powdered, coated, or stained so as to conceal damage or inferiority.

Saccharin can not be considered under this subdivision.

Fifth. If the food contain any added "*poisonous or other added deleterious*" ingredient which may render such an article injurious to health.

The Referee Board has decided that saccharin (0.3 gram per day) added to the food is "without deleterious or poisonous action and is not injurious to the health." We have shown positively that the use of one one-hundredth of 1 per cent of saccharin in food could not equal the quantity of 0.3 gram per day under any possible circumstance.

It must therefore be concluded that the use of saccharin, properly limited as above, comes within the protection and permission of the food and drugs act, and that the Board of Three Secretaries are empowered and by section 3 of the said act directed to make and promulgate rules and regulations governing its use in foods.

All of which is respectfully submitted.

[Signed] FRANCIS E. HAMILTON,
*Counsel for Saccharin Manufacturers,
Except Monsanto Chemical Works.*

EXHIBIT A.—EXCERPTS FROM OFFICIAL CONCLUSION OF REFEREE BOARD OF CONSULTING SCIENTIFIC EXPERTS.

"The conclusion that I reached was that the disturbances noted were probably in no way connected with the intake of saccharin."—*Rept., p. 16.*

"The subject may be regarded as having passed through the saccharin periods without the tenor of his health having been influenced."—*Rept., p. 16.*

"No disturbances whatever were reported throughout the entire period of the experiment."—*Rept., p. 16.*

"The figures taken together, however, fail to show any specific effects due to the saccharin upon the total amount of food ingested day by day."—*Rept., p. 23.*

"A study of the results of the analyses of the gastric contents in the three subjects justifies the conclusion that in these experiments saccharin produced no constant change on the secretions or motor functions of the stomach."—*Rept., p. 88.*

"The conclusion to be drawn from the study of the blood of these subjects is, therefore, that saccharin in this series of experiments had no influence upon the blood in respect to its hemoglobin content, the number of red cells, the number of leucocytes, or the differential count of the white cells."—*Rept., p. 90.*

"In conclusion, it may be said that, both from the testimony of the subject in regard to his condition and from the results of the physical examination, no deleterious effects could be attributed to the ingestion of saccharin."—*Rept., p. 101.*

"The sodium salt of saccharin, even in much greater concentrations than that which might be employed for sweetening food, *had no material influence upon the action of the enzymes of the saliva and pancreatic secretions concerned with the hydrolysis of starch.*"—*Rept., p. 129.*

"The sodium salt of saccharin, *even in much greater concentration than that which might be employed for the sweetening of food*, had no material influence upon the action of the tryptic enzyme of the pancreas upon casein or of the lipoclastic enzyme of the pancreas upon olive oil."—*Rept.*, p. 130.

"In no case was any evidence obtained of any specific inhibiting action upon enzymes of saccharin or by its sodium salt. *Such quantities of these substances as might be employed for the sweetening of food are unlikely to affect the normal physiological activity of the digestive enzymes.*"—*Rept.*, p. 130.

"No evidences of gastric disturbance clearly referable to saccharin were noted during the period of feeding with small doses of 0.3 gram of saccharin daily, and it appears unlikely that such doses, *even when long continued*, are the occasion of clinical manifestations of disturbed gastric digestion."—*Rept.*, p. 130.

"There is little to be said in regard to the effects of saccharin upon processes of metabolism. Our work indicates that *no significant deviation in nitrogeneous metabolism is brought about through the action of saccharin even in considerable doses.*"—*Rept.*, p. 133.

EXHIBIT B.—LETTER FROM MR. HAMILTON.

DECEMBER 4, 1911.

THE BOARD OF THREE SECRETARIES,

Washington, D. C.

GENTLEMEN: Responding to your inquiry made on November 22, as to the action of the several States in the matter of the prohibition of saccharin, I would respectfully state that, having written in June last to the health department of each State, I was favored with only 13 replies.

The States of California, Connecticut, Indiana, Maine, North Carolina, Tennessee, and Virginia advised me that, following the action of the Federal authorities, they had prohibited the use of saccharin at various times from June, 1911, until January 1, 1912.

The States of Kansas, Louisiana, Michigan, Minnesota, Oklahoma, and Wisconsin advised me that, irrespective of Federal action, they forbade the use of saccharin in foods.

No reply was received from any of the other States.

Yours, very truly,

[Signed]

FRANCIS E. HAMILTON.

BRIEF BY WARWICK M. HOUGH, ATTORNEY FOR THE
MONSANTO CHEMICAL WORKS.

I.

It is obvious that the conclusions of the Referee Board should be considered and interpreted in the light of the provisions of the food and drugs act of Congress, and not apart therefrom.

In this connection the following provisions of that law are all that need be considered:

SEC. 7. That for the purposes of this act an article shall be deemed to be adulterated:

In the case of food:

First. If any substance has been mixed and packed with it so as to reduce or lower or injuriously affect its quality or strength.

Second. If any substance has been substituted, wholly or in part, for the article.

Third. If any valuable constituent of the article has been wholly or in part abstracted.

Fourth. If it be mixed, colored, powdered, coated, or stained in a manner whereby damage or inferiority is concealed.

Fifth. If it contain any added poisonous or other added deleterious ingredient which may render such article injurious to health.

The questions certified to the Referee Board of Consulting Scientific Experts by the Secretary of Agriculture, bearing on saccharin, are as follows:

1. Does a food, to which there has been added *saccharin*, contain an added poisonous or other added deleterious ingredient which may render said food injurious to health? (a) in large quantities? (b) in small quantities?

2. If saccharin be mixed or packed with a food, is the quality or strength of said food thereby reduced, lowered, or injuriously affected? (a) in large quantities? (b) in small quantities?

The first inquiry submitted is obviously based upon the fifth subdivision of sec. 7 of the food and drugs act quoted above, and the second inquiry is obviously based upon the first subdivision of sec. 7 of the food and drugs act quoted above, and the second, third, and fourth subdivisions, quoted above, should, therefore, be dismissed from further consideration.

The conclusions of the Referee Board are expressed in three paragraphs, the first of which is as follows:

(1) Saccharin in small quantities (0.3 gram a day or less) added to the food is without deleterious or poisonous action, and is not injurious to the health of normal adults, so far as is ascertainable by available methods of study.

This conclusion is responsive to the second subdivision of the first inquiry submitted by the Secretary of Agriculture; therefore a food (as, for instance, corn) to which had been added 0.3 gram, or less, of saccharin, could not be said to—

contain any added poisonous or other added deleterious ingredient which may render such article injurious to health

within the meaning of that language as used in subdivision fifth of sec. 7 of the food and drugs act quoted above.

The first part of the third conclusion of the Referee Board is as follows:

(3) The admixture of saccharin with food in small or large quantities has not been found to alter the quality or strength of the food.

This is completely responsive to both parts of the second inquiry submitted by the Secretary of Agriculture, and, therefore, if saccharin in any quantity has been mixed or packaged with a food (as, for instance, corn), it could not be said that the "quality" or "strength" of the said food (corn) had been reduced or lowered or injuriously affected within the meaning of the first subdivision of sec. 7 of the food and drugs act above quoted.

In view of the foregoing conclusions, a food to which had been added 0.3 gram of saccharin or less could not be said to be adulterated under any of the provisions of the food and drugs act, and therefore the three Secretaries can find no justification in the conclusions of the Referee Board which are responsive to the inquiries submitted to it by the Secretary of Agriculture for saying, as they did say, in F. I. D. 135, that—

The Secretary of Agriculture, therefore, will regard as adulterated under the food and drugs act foods containing saccharin which * * * are manufactured or offered for sale in the District of Columbia or the Territories, or shipped in interstate or foreign commerce, or offered for importation into the United States.

II.

A further conclusion of the Referee Board is as follows:

(2) Saccharin in large quantities (over 0.3 gram per day, and especially above 1 gram daily) added to the food, if taken for considerable periods of time (especially after months), is liable to induce disturbances of digestion.

Such a finding or conclusion on the part of the Referee Board is not responsive to any inquiry which had been submitted to it by the Secretary of Agriculture, nor is such a conclusion based upon any of the provisions of the food and drugs act.

To say that a food containing saccharin in large quantities is *liable* to "induce disturbances of digestion," if taken for considerable periods of time (especially after months), is vastly different from saying that a food which contains saccharin in large quantities is a food which contains an "added poisonous or other added deleterious ingredient which may render such article injurious to health."

The latter phraseology, in quotations, is the language of the food and drugs act, and such language, or, an inquiry based thereon, is not met by a statement that a food with added saccharin in *large* quantities is "*liable* to induce disturbances of digestion," after a long period of time.

Such a conclusion on the part of the Referee Board is only another way of stating what it said in reply to a similar inquiry submitted to it by the Secretary of Agriculture in reference to sodium benzoate, in large doses.

The Referee Board stated with respect to that product as follows:

Second. Sodium benzoate in large doses (up to 4 grams per day) mixed with the food has not been found to exert any deleterious effect on the general health, nor to act as a poison in the general acceptation of the term. In some directions there were slight modifications in certain physiological processes, the exact significance of which modifications is not known.

(See F. I. D. 104.)

Yet the action of the three Secretaries in F. I. D. 135 is not in harmony with the action of the three Secretaries in F. I. D. 104, though the conclusions of the Referee Board are substantially the same in both cases.

The action of the three Secretaries with reference to saccharin, as set out in F. I. D. 135, though not justified by the conclusions of the Referee Board based upon any of the provisions of the food and drugs act, might have been induced by consideration of the fact that, inasmuch as saccharin may be used in a number of different foods, it might be possible for an individual to eat so many different kinds of food in a day, each of which might contain saccharin, that he would thus consume such an amount of saccharin as might induce disturbances of digestion.

The natural delimitation upon the use of saccharin would make this practically impossible, no matter how hearty an eater or drinker any individual might be, because only minute quantities of saccharin can be used in order to accomplish the purposes aimed at by its use. If used in large quantities the very opposite effect of that desired

by its users is created. It is used only as a "sweetener." Volume for volume it is five hundred times sweeter than cane sugar. If used in excessive amounts, instead of producing a sweet taste or flavor, it produces a bitter taste or flavor.

But there is another way in which its use can be safeguarded. According to statistics furnished by the Smithsonian Institute the average total daily consumption of solids and liquids by man in full vigor is six pounds, of which thirty-seven ounces is allotted to water.

While it is obvious that saccharin would never be used in water, or fresh meats, or potatoes (and these articles furnish the bulk (in weight) of what is consumed by man), let us assume for the sake of the argument that saccharin is to be used in *everything* that goes to make up the six pounds constituting the average daily consumption by man, including water, fresh meats, and potatoes. There are 7,000 grains in a pound, so that six pounds would amount to 42,000 grains. One one-hundredth of 1 per cent is enough saccharin for all practical purposes, and $\frac{1}{100}$ of 1 per cent of 42,000 grains is 4.2 grains; 0.3 gram is 4.5 grains, which is the amount of the "small quantity" referred to in the first conclusion set out in the report of the Referee Board. So that, if a regulation should be made limiting the use of saccharin in foods to $\frac{1}{100}$ of 1 per cent, it would not be possible for a man to take into his system in a day as much as 0.3 gram, even if it was to be put in that proportion ($\frac{1}{100}$ of 1 per cent) into everything which went into his stomach.

As a matter of fact, if so limited, no individual would ever get *one-half* of 0.3 gram, *no matter how many classes of food there are in which saccharin has been used*, because the foods (including drink) which contribute the larger amount to the total weight of all food consumed, are foods to which there would never be any occasion to add saccharin.

According to the last edition of the Encyclopaedia Britannica the daily consumption of food in weight, is placed at *less* than six pounds; and according to the data in the Department of Agriculture (Circular 110) woman of full vigor consumes but 80 per cent of what is consumed by man of full vigor; a boy or girl, from 60 to 90 per cent; and a child from 30 to 50 per cent.

There is still another way of demonstrating the practical impossibility of a man in full vigor getting as much as 0.3 gram of saccharin daily, if there were no restriction whatever against its use.

According to statistics, the annual consumption of sugar in the United States is seven billion (7,000,000,000) pounds.

Assume for the sake of the argument that every woman and child would consume as much as a man in full vigor, and divide this seven billion pounds by ninety million (90,000,000) people.

This gives a yearly consumption of 77.77 pounds per capita. There are seven thousand grains in a pound; so, multiplying 77.77 pounds by seven thousand (7,000) grains, gives approximately 544,390 grains.

Divide this by 365, the number of days in a year, and we have 1,491 and a fraction, as representing the daily consumption per capita of sugar in grains.

Saccharin is five hundred times sweeter than sugar, volume for volume—one-quarter of a grain of saccharin having approximately the sweetening qualities of one full lump of sugar; so, dividing 1,491 grains of sugar by 500 gives less than 3 grains of saccharin as the daily consumption of saccharin per capita, if all the sugar consumed in the United States were to be immediately displaced by saccharin! This is only two-thirds of the small amount (4.5 grains) the use of which the Referee Board finds to be absolutely harmless.

If this small amount (4.5 grains) is multiplied by five hundred, we have 2,250 grains as the average daily consumption of sugar per capita, instead of 1,491, on the theory that the total consumption is seven billion pounds.

If the total consumption should be but five billion (5,000,000,000) pounds, as was suggested by the Secretary of Agriculture, then the figures are largely increased in favor of the argument I make. As a matter of fact, it would be absolutely impossible for saccharin to displace sugar altogether, for there are many preparations, such as confectionery and syrup, in which cane sugar is needed as a filler or for volume.

III.

We have thus seen that the Referee Board has *not* found that a food which contains saccharin in either large or small quantities could be said to—

contain any added poisonous or other added deleterious ingredient which may render such articles injurious to health within the meaning of that provision of the food and drugs act. It simply found that in *large* quantities after a *long period* of time it is *liable* to induce disturbances of digestion. On the other hand, the Referee Board positively and specifically states that a food to which has been added saccharin in small quantities is not a food which could be said to—

contain any added poisonous or other added deleterious ingredient which may render the said food injurious to health.

It furthermore distinctly and specifically finds that a food with which saccharin has been mixed or packed in either large or small quantities has not had either its "quality" or "strength" reduced or lowered or injuriously affected.

These findings or conclusions cover every question which was submitted to the Referee Board by the Secretary of Agriculture, and they also cover every question which might possibly be submitted to the Referee Board under the food and drugs act, and which the Referee Board might be expected to answer, in view of the fact that they are chemists and not lawyers. They were not asked to express themselves as to the food value of sugar or as to whether the use of sugar, in large or small quantities, would render the food to which it was added injurious to health, or whether the use of food to which sugar might be added in large quantities, for a long time, and probably after many months, would be liable to impair digestion; or even whether the use of cane sugar as a sweetener was better than saccharin.

Yet the Referee Board, without being asked by the Secretary of Agriculture, and without any justification for so doing, so far as any provisions of the food and drugs act are concerned, made a further answer in connection with its third conclusion.

It is not even justified by any of the experiments which were made by the Referee Board to enable it to reply to the inquiries submitted by the Secretary of Agriculture. (See Report No. 94, issued Nov. 15th, 1911.)

This obiter dictum on the part of the Referee Board is as follows:

It is obvious, however, that the addition of saccharin to food as a substitute for cane sugar, or some other form of sugar, may be regarded as a substitution involving a reduction in the food value of the sweetened food product, and hence as a reduction in its quality.

It is reasonable to suppose that the Referee Board never intended that anything expressed in this sentence was to be considered as contradicting what it had said in the immediately preceding sentence, which immediately preceding statement was:

The admixture of saccharin with food, in small or large quantities, has not been found to alter the quality or strength of the food.

This statement answers the questions suggested by the act of Congress on the subject, and answers specifically the inquiry of the Secretary of Agriculture.

The succeeding obiter dictum must therefore be regarded as referring to something else, and should, therefore, be entirely disregarded by the three Secretaries in framing a food-inspection decision which might correctly interpret the conclusions of the Referee Board, which were responsive to the inquiries submitted to it by the Secretary of Agriculture.

There is no provision in the food and drugs act to which this obiter dictum can apply, and, therefore, no action with respect to saccharin could be justly predicated upon any such statement.

But, as a matter of fact, what did the Referee Board mean by that statement?

Is it not possible that two separate and distinct ideas have been blended and confused?

There is a provision in the law to the effect that a food is to be regarded as adulterated if any substance has been mixed and packed with it so as to reduce or lower or injuriously affect its quality or strength; but the board has already found that the quality or strength of a food was not reduced or lowered or injuriously affected, because it said it was not "altered," by the mixture with it of saccharin in either small or large quantities.

There is another provision in the law to the effect that a food is to be regarded as adulterated—

if any substance has been substituted, wholly or in part, for the article.

Obviously what the Referee Board had in mind was, that there was some food value in cane sugar, and there was probably no food value in saccharin, and that if saccharin was used as a "sweetener" instead of cane sugar, the consumer would lose the food value which might be in the cane sugar.

Assuming such premises to be true, the conclusion is wholly without importance, so far as the food and drugs act is concerned. There is no provision in the food and drugs act to which the conclusion of the Referee Board is responsive.

Furthermore, if a manufacturer takes saccharin to sweeten corn or any other food, instead of using sugar, he commits no offense under the food and drugs act if the saccharin is not an "added poison" or if its addition does not reduce or lower or injuriously affect the quality or strength of the food to which it is added; and both of these points are answered in the negative by the Referee Board.

Take any food which may suggest itself—corn, for instance. If I mix saccharin with it in any amount, the "quality" or "strength" of the corn is not reduced, lowered, or injuriously affected, because the Referee Board has so found.

The same is true, if instead of adding a "sweetener" I should add salt. Salt is a mineral substance and has no food value, but is much desired by some tastes. But if I should conclude to add salt to corn instead of adding a "sweetener," it could not be said that a substance had been substituted wholly or in part for the corn.

That provision of the food and drugs act which says that a food shall be regarded as adulterated if any substance has been substituted, wholly or in part for the article, has reference to the food itself, and not to the fact that one thing is added to the food when something else might have been added. Therefore, if any food is

sweetened with saccharin the food could not be said to be adulterated within the meaning of the food and drugs act, on the ground that a substance had been substituted wholly or in part for it.

If that argument could be made successfully with reference to saccharin, it could be made successfully if cane sugar were added, or if salt or any other condiment were added. Any article of food, no matter what it may be, to which either salt or sugar or saccharin or pepper or spice, one or all, might be added in preparing it for consumption, whether before or after an interstate shipment, can not accurately be said to be an article which is adulterated within the meaning of the food and drugs act on the ground that some substance had been substituted, wholly or in part, for it; and since such an article of food could not be said to—

contain any added poisonous or any other added deleterious ingredient which may render such article injurious to health—

and since it could not be said to—

contain a substance which had been mixed or packed with it so as to reduce or lower or injuriously affect its quality or strength—

it can not be regarded as adulterated under the food and drugs act.

This obiter dictum, therefore, of the Referee Board is uncalled for, inconclusive, and valueless, so far as the food and drugs act is concerned, and so far as any inquiry submitted to it by the Secretary of Agriculture is concerned; and it is a grave departure from the purpose of the inquiry for the three Secretaries to try to give any effect to it in any regulation which they are authorized to make under the food and drugs act.

What difference does it make *under* the food and drugs act if corn was mixed with milk? It might have either greater or less food value than if it was mixed with sugar or salt.

There is nothing in the law which prohibits my mixing anything with a food, unless it is either a deleterious substance injurious to health, or unless it reduces or injuriously affects the quality and strength of the food *to which* it is added.

The addition of one substance to another substance can not be regarded as a substitution of the one for the substance to which it may be added, or with which it may be mixed.

“Substitution” within the meaning of the food and drugs act is a deception; and that provision of the law simply relates to a case in which the consumer expects to receive one substance and receives another substance, either wholly or in part, *without his knowing that he receives it*.

No one who buys a can of corn or any other article of food buys it because he thinks it has been flavored with sugar or salt. He is buying the corn, not the sugar, and probably has not the faintest

conception that it is artificially flavored at all, but all suggestion of substitution is removed the very instant a declaration appears on the food as to what it does contain, and the makers and users of saccharin have never objected to an appropriate declaration upon the label to the effect that it has been sweetened with saccharin.

This argument might be epitomized as follows: A pound of corn equals seven thousand grains; if $\frac{1}{1000}$ th of 1 per cent of saccharin had been added to it as a sweetener, it would contain but 0.7 of a grain of saccharin (the small quantity referred to in the Referee Board's report being 4.5 grains).

Suppose as much as 0.1 gram, equal to 1.5 grains had been added, and a question should arise as to whether it was adulterated within the meaning of the food and drugs act, it could not be reasonably argued:

First. That a substance had been mixed or packed with the corn which reduced or lowered or injuriously affected the quality or strength of the corn, because the Referee Board particularly found that the admixture of saccharin in food in small or large quantities did not alter the quality or strength of the food.

Second. That any substance had been substituted wholly or in part for the corn; because the word "substituted" in this connection in the pure food law means to put something in, in the place of the corn, and does not mean the *addition* of one thing to the corn in preference to another thing.

Third. That any valuable constituent of the *corn* had been wholly or in part abstracted.

Fourth. That the corn had been mixed, colored, powdered, coated, or stained in a manner whereby damage or inferiority *in the corn* is concealed.

Fifth. That the corn contained any added poisonous or other added deleterious ingredient which may render such article injurious to health; because the Referee Board specifically finds that the addition of saccharin to food in even three times the amount (up to 4.5 grains, which is the equivalent to 0.3 gram), is without deleterious or poisonous action, and is not injurious to the health of normal adults.

Therefore, it is obvious that so far as the duty of the three Secretaries under the food and drugs act is concerned, they have no more to do with this obiter dictum of the Referee Board than if it had been the repetition of the Lord's prayer. In making that dictum, they were abandoning the domain of chemistry and were encroaching upon the domain of law.

So far, therefore, as the provisions of the food and drugs act are concerned—and they should be absolutely conclusive upon the three Secretaries—and in view of the findings of the Referee Board which were responsive to the inquiries submitted to it by the Secretary of Agriculture, the three Secretaries should have made the identical

regulation with respect to saccharin which was made with respect to sodium benzoate.

For the purpose of meeting fears, however, which are neither justified by the findings of the Referee Board on the questions submitted by the Secretary of Agriculture, nor warranted by any of the provisions of the food and drugs act, the saccharin manufacturers will not object to a regulation which limits its use in foods to $\frac{1}{16}$ of one per cent and which requires a statement upon the label to the effect that it has been so added.

IV.

The suggestion has been made once or twice that this is a case for the courts, but I respectfully submit that it is not, for several reasons.

In the first place, it would not avail the manufacturers much to have a court declare that the addition of saccharin to a food was not a violation of any of the provisions of the food and drugs act, after the business of the manufacturer had been totally destroyed by the regulation made by the three Secretaries.

In the second place, the machinery of the law which has been devised with reference to the food and drugs act was for the very purpose of having all questions which could be raised under the act settled without either the expense or the injury to the business of the country which would be incident to an enforced stoppage, while the courts were passing upon the various questions which might be raised.

In the third place, since the Referee Board has made clear and definite findings with respect to every question which was submitted to it under the food and drugs act, the three Secretaries should not now suggest that the same questions should be passed upon by the court.

The manufacturers are willing to accept these findings on the part of the Referee Board, and therefore the only question which should now be open for discussion is as to the correct construction of the Referee Board's report and the regulation to be made in view of its finding on the questions which were submitted.

There is no way that I know of in which the question as to the correct interpretation of the conclusions of the Referee Board could be submitted to a court, and it would be obviously unfair to submit any other inquiry, particularly under a ruling by the three Secretaries to the effect that the use of saccharin in foods was a violation of the food and drugs act.

The obiter dictum in the conclusions of the Referee Board should not operate to confuse the very clear proposition which is before the three Secretaries, based upon the inquiries submitted by the Secretary

of Agriculture, and the replies of the Referee Board which are responsive thereto.

The three Secretaries should not overlook the natural right of every individual to make such combination of materials for food to be sold in interstate commerce as he may desire, provided he does not violate the food and drugs act; and the food and drugs act is not to be extended in its operation beyond the plain language of the act, with a view to the exercise of a benevolent paternalism.

Respectfully submitted.

WARWICK M. HOUGH,
Attorney for Monsanto Chemical Works.

BRIEFS SUBMITTED BY THE BUREAU OF CHEMISTRY.

STATEMENT BY H. W. WILEY, CHIEF.

DECEMBER 6, 1911.

The SECRETARY OF AGRICULTURE.

SIR: In response to your request for a review of the statements made before the three Secretaries in regard to validating the use of saccharin I beg to inform you that I have asked Dr. Bigelow and Dr. Kebler to prepare briefs on this subject. These briefs are appended.

My own opinion in this matter has never changed. Saccharin is in its name a fraud and to the great majority of people in this country it means sugar. For this reason alone, if there were no other, it should be barred from the foods of the country. Saccharin is always used for the purpose of fraud and deception and conceals inferiority by producing in a food product a sweet taste not due to sugar, which naturally produces this taste. For this reason it is clearly to be excluded from foods under the food and drugs act. Saccharin, too, is undoubtedly a substance which of necessity must be injurious to health.

In addition to the material summarized by Dr. Bigelow and to the opinion of the Referee Board, I beg to call your attention particularly to one of the statements in Dr. Folin's paper, i. e., that saccharin was excreted from the kidneys unchanged. The continued pouring of a foreign body of this kind, which must have very active properties, through the delicate cells of the kidneys can not fail in time to produce serious disturbances of function and even fatal disease. That and the other reasons which have been so ably presented by many authorities are sufficient to convince me beyond any reasonable doubt that the use of saccharin in any quantity is necessarily injurious.

The argument that it may be used in small quantities is the old, familiar one which adulterators and those who seek to adulterate have used from the very beginning of things. If we admit one injurious substance in small quantities we can not with any justice exclude any other. If this principle is acted upon and becomes valid by authority of law we can not with any consistency object to any

small quantity of borax, benzoate of soda, benzaldehyde, formaldehyde, sulphate of copper, salicylic acid, or coal-tar dyes, or any other of the deleterious bodies which the debasers of food have used and are using to-day. The argument of small quantities has absolutely no ethical, logical, or legal foundation and is most dangerous. The result of admitting the justice of this argument and acting thereon would be to validate under the high authority of the law the use of small quantities of dangerous and threatening substances and thus intrench the practice of adulteration firmly under the protection of the law. No more dangerous concession to the interests seeking to debase and adulterate and misbrand food products could be made.

It is with earnest feelings as to the correctness of my demand that I urge upon you and the other Secretaries as strongly as I can the importance of refusing in any way to condone the use of saccharin in foods after the period which has already been fixed, i. e., January 1, 1912.

In the hope and the expectation that this will be the final action of the three Secretaries, I am,

Respectfully,

[Signed]

H. W. WILEY,

Chief.

(Inclosures: Two briefs on saccharin.)

**BRIEF BY W. D. BIGELOW, ASSISTANT CHIEF, AND CHIEF DIVISION
OF FOODS.**

PROPOSED EXTENSION OF THE USE OF SACCHARIN.

In the consideration of this subject, it is necessary to have in mind the claims of manufacturers in their advertisements regarding the place saccharin should have in the preparation of foods. I attach hereto (Exhibit A) a list of foods in which the manufacturers have claimed that saccharin might be advantageously substituted for sugar. In the advertising book, of which Exhibit A is a digest, the advantages claimed for saccharin for household use are pointed out. It is recommended for sweetening coffee, tea, milk, grog, punch, fruit beverages, hot ale, spiced and herbal drinks. It is recommended that it be used for sweetening glucose (which has practically no sweetness of its own) in the proportion of 1 part to 500 and that in this manner a sirup be made for general use. A product has been offered on the American market consisting of anhydrous dextrose (starch sugar) sweetened with saccharin. If the ideas of the manufacturers were to be followed out, therefore, cane and beet sugar might be eliminated from our daily diet and replaced entirely by saccharin, except in so far as they occur naturally in foods, such as fruits. The booklet referred to suggests that saccharin is suitable for the diet of children. The following sentence, taken from page 95, is

especially striking: "Saccharine is destined to act a leading part in the rearing of infants that are not suckled at the mother's breast but nourished artificially."

The menus given below are made up with a view to including the amount of saccharin which might readily be found in a day's diet if the plan of the manufacturer as outlined above were followed. These menus are simple and do not contain an unusual amount of carbohydrates. Very many people, and especially those suffering from nephritis, are likely to follow a diet much richer in carbohydrates than those given below. To these menus might be added sweets of various kinds, including the cheaper grades of candy, in which a considerable amount of saccharin might be employed, and especially soft drinks in which saccharin is now chiefly employed. The amounts of saccharin given in these menus are the amounts which it is believed would be required to sweeten the corresponding dishes to the extent desired by the average consumer. In fixing these amounts only one helping of fruit, one cup of coffee, etc., is contemplated.

DAY 1.

CHILD'S MENU.

Breakfast :	Saccharin, <i>grams</i> .
Strawberries.....	0.050
Oatmeal.....	.040
Bacon or ham.....	----
Hot cakes (sirup).....	.060
Lunch :	
Meat	----
Jelly or preserves.....	.060
Bread and butter.....	----
Milk	----
Dessert.....	.030
Dinner :	
Soup	----
Banana fritters.....	.020
Potatoes.....	----
Tomatoes.....	.010
Bread and butter.....	----
Ice cream.....	.040
Poundcake.....	.040

	.350

ADULT'S MENU.

Breakfast :	Saccharin, <i>grams</i> .
Strawberries.....	0.050
Oatmeal.....	.040
Bacon or ham.....	----
Hot cakes (sirup).....	.060
Coffee030
Lunch :	
Cold meat	----
Jelly or preserves.....	.060
Salad (vegetable).....	----
Bread and butter.....	----
Chocolate.....	.040
Dessert.....	.030
Dinner :	
Soup	----
Banana fritters.....	.020
Meat	----
Potatoes.....	----
Tomatoes.....	.010
Salad (fruit)	----
Bread and butter.....	----
Ice cream.....	.040
Poundcake.....	.040
Coffee030

	.450

DAY 2.

Breakfast:	Saccharin, <i>grams</i> .	Breakfast:	Saccharin, <i>grams</i> .
Apple sauce-----	0.050	Fruit-----	.050
Oatmeal (cream and sugar) --	.040	Cereal and cream-----	.040
Toast-----	----	Toast-----	----
Soft boiled eggs-----	----	Eggs-----	----
Milk-----	----	Coffee-----	.030
Noon dinner:		Lunch:	
Clear soup-----	----	Baked beans-----	.020
Lamb chop-----	----	Brown bread-----	.020
Peas-----	----	Peach pie-----	.040
Canned peaches-----	.050	Milk-----	----
Plain cake-----	.040	Dinner:	
Supper:		Tomato bisque soup-----	.010
Cocoa-----	.040	Steak and mushrooms-----	----
Creamed potato-----	----	Escalloped potato-----	----
Scrambled eggs-----	----	Corn-----	.002
Stewed fruit and cake-----	.090	Peas-----	.002
	-----	Asparagus salad-----	----
	.310	Cheese-----	----
		Coffee-----	.030
		Ice cream-----	.040

			.284

These menus are based on the supposition that glucose sweetened with saccharin, as has been recommended by the saccharin manufacturers, and anhydrous dextrose sweetened in the same manner, as has been done commercially, be substituted for sirup and sugar, respectively, in the preparation of the foods for the table and their sweetening at the table. The hopes of the manufacturers, however, have not been fully realized in the extent to which saccharin has been used in food. I give in Exhibit B a partial list of commercial foods in which it has been found.

Mr. Hough states in his brief that "it would be absolutely impossible for saccharin to displace sugar altogether, for there are many other preparations, such as confectionery, and sirup, in which cane sugar is needed as a filler or for volume." Yet, 18 years ago, in the advertising booklet referred to in Exhibit A, Fallberg-List & Co. did suggest a mixture of glucose and saccharin, which was intended to take the place of sirup. In this connection it must be remembered that glucose is almost without sweetening power. Moreover, a mixture of anhydrous dextrose and saccharin has been placed upon the market in this country in sealed packages of perhaps 1 or 2 pounds. This preparation was intended solely for household use.

The counsel for the manufacturers propose to limit the amount of saccharin to be added to food to one one-hundredth of 1 per cent. They point out that the total amount of food consumed by a normal

human adult is not more than 5 or 6 pounds and that one one-hundredth of 1 per cent of this amount is less than 0.3 gram, which they say the Referee Board decided was not injurious to health. Considering the fact that a large part of the diet consists of meat, potatoes, etc., they argue that the amount of saccharin consumed by an adult under these circumstances can not possibly be more than 0.15 gram a day.

The counsel for the manufacturers say that invalids and children consume less food than normal adults and hence, even if 0.01 per cent of saccharin were added to all food, they would consume less saccharin than the amount given above. In this connection it must be borne in mind that while invalids and children consume less food they are likely to consume more sweetened food than normal adults and they are also much more susceptible to the toxic effects of saccharin.

COMMENT ON BRIEFS OF COUNSEL FOR MANUFACTURERS.

The counsel for the manufacturers appear to misinterpret the first and third conclusions of the Referee Board. The first conclusion reads as follows:

Saccharin in small quantities (0.3 gram a day or less) added to the food is without deleterious or poisonous action, and is not injurious to the health of normal adults, so far as is ascertainable by available methods of study.

The counsel for the manufacturers interpret this to mean that the Referee Board held that saccharin occurring in the food in the amount of 0.3 gram per day or less is not injurious to health. In other words, that such food could not be said to contain any added poisonous or other deleterious ingredient which may render such article injurious to health. Their argument in this matter is certainly erroneous. The Referee Board in the sentence quoted only refers to the "health of normal adults, so far as is ascertainable by available methods of study." These carefully guarded words can only be understood to mean that the board had in mind the probability that saccharin was injurious when present in a less amount than that which would be shown to be injurious by "available methods of study"; also that the Referee Board when writing these words had in mind the fact that invalids, and especially children, are far more susceptible to the influence of drugs than "normal adults."

Mr. Hough also states, in substance, that to say that a food containing saccharin in large quantities is liable to induce disturbance of digestion, etc., is vastly different from saying that such food contains an "added poisonous or other added deleterious ingredient which may render such article injurious to health." It is evident that the difference between these two forms of expression did not

occur to the Referee Board nor would it occur to any impartial physiologist. A substance which is recognized as liable to induce disturbances of digestion is believed to be injurious.

Again referring to the use of saccharin in canned corn, the argument of the counsel for the manufacturers appears to be that saccharin is used not as a substitute for a portion of the corn but for a portion of the sugar used to sweeten the corn. They overlook the fact that sugar is a constituent of sweet corn, and that the best varieties, if cooked when entirely fresh and in the proper stage of maturity contain a sufficient amount of ordinary sugar to give them the desired flavor. The food contemplated in the law is obviously the finished product in the condition in which it is shipped, and includes as an integral part the sugar necessary to sweeten it. If saccharin is added in place of a portion of this sugar, certainly a "substance has been substituted * * * in part for the article" just as truly as if the sugar naturally occurring in the corn were in some way removed and saccharin added in its place. Green sweet corn contains from 8 to 15 per cent of sugar, according to variety, season, the locality in which it is grown, and its state of maturity and freshness. There is no question but that the housewife attributes the sweetness of sugar corn to ordinary sugar, and realizes that if corn grown in her garden or purchased in the market—canned by herself or by a commercial canner—is deficient in sweetness that difficulty can be cured by the addition of sugar. She expects the corn to contain sufficient sugar to give it this desired degree of sweetness, whether the sugar grew in the corn or was added to it in canning. (In the case of canned corn she may assume that the sugar present is natural to the corn unless the label declares otherwise, but that is another matter.)

Certainly the housewife will be deceived if this sweetness, which her experience teaches her results from sugar, is really due to the presence of saccharin. Even if the presence of saccharin were declared on the label there are probably many housekeepers of average intelligence who would still be deceived. The word "saccharin" itself is a misnomer and many probably would not be able to distinguish between the word "saccharin," which has been erroneously applied to a nonassimilable, synthetic product, and the term "saccharose," which has been largely used to designate sucrose or cane sugar. Moreover, the adjective "saccharine" is used to designate sweetness due to cane or beet sugar.

Mr. Hough has chosen to separate the two portions of the third conclusion of the Referee Board, although it is obvious that the first portion when given by itself will necessarily convey a meaning which the board did not intend to convey and which they did not believe. For example, the term "sweet pickles" is used to apply not to the

original cucumbers from which the pickles were made, but to the finished article after it has been cured and sweetened. The third conclusion of the Referee Board if applied to sweet pickles can only be construed to mean that saccharin when applied to untreated cucumbers does not alter their quality or strength. If, however, in the preparation of sweet pickles saccharin is used in place of sugar, which is supposed to be used, then it is substituted for sugar and the consumer is deceived. It is obvious, therefore, that the last half of the third conclusion of the Referee Board can not be considered *obiter dictum*, as stated by Mr. Hough, but is the culminating conclusion of their carefully prepared report and is necessary to convey their meaning and to answer the question submitted to them.

I am not familiar with the objections which, according to Mr. Hough, were made to cane sugar for more than 1,000 years after its discovery or until about the seventeenth or eighteenth century. Assuming for the sake of the argument that his statement is true, however, I see no analogy between the opinion of the world regarding sugar then and the opinion of the world regarding saccharin now. Physiological chemistry, pharmacology, nutrition, and even the practice of medicine are modern sciences. They have been revolutionized within the memory of those now living, and pharmacology and physiological chemistry have received their chief study during the last few years.

Again, in his argument before the three Secretaries, Mr. Hough makes the statement that the human system needs cane sugar much less than it needs a fruit sugar or a honey. Corn sugar, he says, contains "other things which are detrimental to health." In this statement Mr. Hough is obviously misinformed. The product sold on the market as cane sugar and used by manufacturers of foods and by the housekeeper is practically pure. It is readily converted by the acid of the stomach and by the enzymes of the digestive tract into invert sugar, which is the characteristic sugar of honey. The sugars of fruits consist of invert sugar or of varying mixtures of cane sugar and invert sugar.

It is interesting to note Mr. Hough's casual reference to the "willingness of manufacturers and users to state upon the label that it (saccharin) is so used and the amount in which it is used." This willingness is of very recent origin, if it exists. For a considerable time after the enforcement of the food and drugs act manufacturers objected very seriously to indicating the presence of saccharin on foods which contained it. Rather than indicate on the label the presence of saccharin many manufacturers of foods discontinued its use before the conclusions of the Referee Board were announced. Moreover, while canned corn is probably the most favorable article for their line of argument that the attorneys for the manufacturers

could have chosen, it is not a typical illustration. In fact, Mr. Hamilton stated in the hearing of May 23 that saccharin was no longer used in corn. A fairer illustration would have been the soft drinks in which sugar is often largely and sometimes entirely replaced by saccharin.

The counsel for the manufacturers both suggest that a food inspection decision be issued limiting the amount of saccharin which may legally be added to food and requiring a statement of the amount added to be printed on the label. In view of their other arguments the question at once arises by what authority the amount may be so limited and by what authority the amount may be required to be printed on the label. One of the reasons given for excluding saccharin from food is that it is injurious to health. It would be a very difficult matter indeed to prove that $\frac{1}{90}$ of 1 per cent was injurious to health or was probably injurious to health and that $\frac{1}{110}$ of 1 per cent was not.

In our Kansas City bleached flour case that kind of argument was thoroughly tried out. It was shown by the Government that it would be entirely impossible to state with what amount a substance in a given food began to be injurious. It was admitted by the experts of the defense on cross-examination that such an amount would depend not only upon the maturity and state of health of the subject, but also upon what other amounts of the same injurious substance or of other injurious substances he was receiving in his food or otherwise. As a result of the argument presented in this case, Judge McPherson charged the jury that they had to consider the character, not the quantity, of the added substance; that the food might be consumed by all classes of persons—the young, the old, the sick, the well, the weak, the strong; that it was “not conceivable that Congress intended that producers and vendors might continue to add poisonous and other injurious substances to foods so long as the quantity added was not enough to produce observable injurious effects upon the health of the consumers.”

Again, in the same charge to the jury, Judge McPherson said:

It will be noted that the act does not say “any added poison,” but does say “any added poisonous ingredient.” The word “poisonous” as an adjective conveys a descriptive meaning and is used in a qualitative sense and not in a quantitative sense. That is, it refers to the kind of substance and not to the quantity of the substance. This idea or meaning is further emphasized and rendered more certain by the qualifying clause, “which *may* render such article injurious to health.” It does not say “which *does* render such article injurious to health,” but manifestly it was the purpose of Congress to include in this distinction all ingredients of a *poisonous character* to which in their essential nature might be ascribed the tendency to affect health injuriously. * * *

Therefore the court charges you that the Government need not prove that this flour or foodstuffs made by the use of it would injure the health of any consumer. It is the *character*, not the *quantity*, of the added substance, if any, which is to determine this case.—(Notice of Judgment 722, pp. 13, 14.)

Again, this question arises, "What authority has the department to require manufacturers to state on their labels the presence of saccharin and the amount present?" If saccharin is injurious to health, its addition to food is forbidden by the law. If it conceals inferiority or causes the food to be adulterated for any of the reasons given under section 7, its presence is forbidden. The counsel for the manufacturers state that if corn is sweetened with saccharin, there is practically no displacement of the corn, which, they say, occurs if corn is sweetened with sugar. If this be true, we can not require the presence of saccharin to be declared on the ground that it displaces a portion of the corn.

Again, the counsel for the manufacturers argue that when saccharin is added to a "food (as, for instance, corn) it could not be said that the quality or strength of said food (corn) had been reduced, etc." From their arguments, therefore, there appears to be no authority to require the statement of the presence or amount of saccharin on the label. As stated above, if there were such authority and a manufacturer should add to the food twice or 10 times or 100 times the amount of saccharin suggested as a maximum by Mr. Hamilton and Mr. Hough, it would probably be as difficult a matter to prove in court that the amount present was an added deleterious substance and might be injurious to health as it would be in the case of less than one one-hundredth of 1 per cent.

Finally, the fact should not be overlooked that the attorneys in this case do not represent the canners of corn, relatively few of whom have used saccharin in the past, and very few, if any, of whom desire to use it now and state its presence on the label. They do not represent the manufacturers of any food. Least of all do they speak for the consumer. They represent solely the manufacturers of saccharin—a substance which has a very restricted use except as a harmful and worthless substitute for a valuable article of food.

[Signed] W. D. BIGELOW,
Assistant Chief, Chief Division of Foods.

EXHIBIT A.—USES OF SACCHARIN RECOMMENDED BY MANUFACTURERS.

In 1893 an advertising booklet was issued by Fahlberg-List & Co., in which directions are given for the use of saccharin in the manufacture of the following substances:

Pp. 128-133: *Utilization of saccharin as a taste corrective.*—Directions are given for the use of saccharin in the manufacture of:

- Cocoa.
- Cod liver oil.
- Mustard.
- Tooth waters, pastes, powders.
- Mouth washes.

Pp. 134-145: *Utilization of saccharin in the manufacture of beverages.*—Recipes are given for using saccharin in the manufacture of:

- Lemonade.
- Ginger beer.
- Fruit water (effervescing).
- Orange tangerine.
- Raspberry.
- Ginger ale.
- Sarsaparilla.
- Effervescing fruit wine.

Pp. 146-154: *Use of saccharin in the manufacture of cordials.*—Recipes are given for the use of saccharin in making:

- Cherry brandy.
- Orange bitters.
- Crème de citron (citron cream).
- Crème d'orange (orange cream).
- White curaçao.
- Curaçao de Hollande (Dutch curaçao).
- Finest kümmel.
- Cherry water (brandy).
- Absinth.
- Lemon squash.
- Simple brandies.
- Double brandies.
- Plain cordials.
- Wine cordials.
- Russian allasch.
- Chartreuse.
- Benedictine.
- Maraschino.
- Extract of punch.
- Essence of punch.

Pp. 166-175:

- Cider.
- Fruit juices (fermented).
- Sweet wines.
- Sparkling wines.
- Champagne.

Pp. 186-200:

- Fruit conserves.
- Fruit sirups (lemonade sirups).
- Stewed fruit.
- Fruit mashers.

Fruit juices.
Apple compote.
Cranberry compote.
Quince compote (highly recommended for diabetic patients).
Hawthorn-berry compote (for urinal complaints).
Currant compote (very suitable for diabetic patients).
Apricot or peach compote.
Rhubarb compote.
Orange sirup.
Blackberry sirup.
Citron sirup.
Raspberry sirup.
Cherry sirup.
Red-currant sirup.
Black-currant sirup.
Vanilla sirup.
Ginger sirup.
Pineapple sirup.
Strawberry sirup.
Elderberry sirup.
Raspberry vinegar.
Strawberry vinegar.
Citron biscuits (for diabetic patients).
Carlsbad cakes.
Poppy-seed rolls.
Almond bread.
Bitter macaroons.
French rolls.
Chocolate cream.
Blancmange.
Vanilla ice.

EXHIBIT B.—FOODS THAT HAVE BEEN FOUND TO CONTAIN SACCHARIN.

Mustard.
Combination pickled salad.
Sweet celery chow.
Spiced sweet gherkins.
Sweet spiced East India chops.
Sweet pickles
Sweet relish.
Pepper relish.
India relish.
Worcestershire sauce.
Catsup.
Baked beans.
Canned corn.
Canned peas.
Canned beans.
Canned strawberries.

Caponati (canned eggplant, etc.).

Wine.

Champagne.

Beer.

Cider.

Liqueurs and cordials.

Creme de menthe cherries.

Near beers.

Carbonated beverages.

Nonalcoholic beverages (ginger ale, ren bre, birch beer, ginger beer, Moxy, etc.).

Fruit juices.

Malt extract.

Bitters.

Soda water sirups.

Cordial of extract of cod liver oil.

Flavors (imitation lemon and vanilla).

Pie fillers (used for lemon custard pies, etc.).

Mincemeat.

Sweet rolls and fancy bread.

Buns.

Wafers.

Pies.

Cakes.

Confections.

Chewing gum.

Sugar (solid dextrose sweetened by cider), maple.

Table sirups (maple, etc.).

Glucose.

Jelly.

Jams.

Preserves.

Compotes.

Marmalades.

Ice cream.

Ice cream cones.

Cassoid biscuit.

Cocoa.

Chocolate, lacto chocolate.

Milk.

Condensed milk.

Corned beef.

Cured bacon.

BRIEF BY L. F. KEBLER, CHIEF DIVISION OF DRUGS.

Sugar is fundamentally a food and is generally recognized by its sweetish taste; it possesses great nutritive value and the price is comparatively reasonable. While saccharin is sweet, it has no food value whatever, and is therefore expensive at any price. The consumer, as a rule, believes that if a product is sweet its sweetness is due to the presence of some form of sugar, and to employ something other than sugar for the purpose of giving this impression is a deception. It is true, many food products may be cheapened and low-grade products made to appear superior by the use of an artificial sweetener, but such cheapening is at the expense of the consuming public.

It has been represented that the discovery of saccharin was of great economic importance and of distinct service to the public. The only economic value saccharin possesses is to enrich the coffers of the manufacturer. It is of no benefit to the public health except as a drug in treating diabetes.

Sugar is one of the great energy-producing foods. Two pounds of sugar represent an amount of energy about equivalent to that expended by a laboring man doing one day's work. Two grams of saccharin—about one-half a teaspoonful—possesses the sweetening power of two pounds of sugar. It is possible, if saccharin is available, to produce preparations resembling foods, though entirely devoid of nutritive value. By using agar-agar, a seaweed product, for instance, together with artificial flavoring and sweetening, an imitation jelly can be made, agreeable and palatable to the consumer, but without food value. This would certainly be giving a stone for bread. Such a possibility should be sufficient to prohibit the general use of saccharin in foods. The use of saccharin would also make it possible to still further reduce the nutritive value of cheap foods, thus directly increasing the cost of living.

The deceptive feature and actual fraud on the consumer in the unrestricted use of artificial sweeteners is recognized by the vast majority of workers interested in the public health. Most European countries either forbid the use of saccharin or restrict it to the manufacture of those commodities which are intended for treating human ailments. In some European countries specific regulations are in force requiring the druggist (who is the only dealer allowed to handle it) to keep an exact record of all saccharin purchased and the disposal made thereof. Brazil prohibits the use of saccharin in food products. Ten of the States in the United States forbid its use, by statute, in foods and beverages, and many State laws on the subject of adulteration are similar to the Federal law.

The bottling interests of Nebraska and Missouri are so much opposed to the use of saccharin in their products that they succeeded in having their respective legislatures pass a special law forbidding its use in bottled goods. At the seventh annual convention of the Texas Bottlers' Association serious objection was made to the use of saccharin. The point was raised that its use insured a saving of only 3 cents per case, which can not be considered as of great economic importance. Because of the recognized fraudulent, injurious, and even dangerous character of saccharin a movement was organized in France to bring about an international agreement interdicting its use in food products and restricting it entirely to physicians for treating diseases.

Representatives of Germany, Austro-Hungary, Belgium, Greece, Italy, Portugal, the Netherlands, and Switzerland met in Paris about a year ago, and adopted a formal resolution prohibiting the use of saccharin in foods and beverages. It was stated at the hearing before the three secretaries that it was "quite natural that anything that would feel itself being gradually displaced would use every effort to create an erroneous impression, so as to retard, if not prevent, its use altogether." This certainly appears to be true in the case of saccharin. From the general attitude of the officials of the civilized world, it is clearly evident that the use of saccharin in foods has met with little favor. It has been legislated against in many quarters, and it is probably for this reason—this feeling of gradual displacement—that the promoters of saccharin are endeavoring to create an erroneous impression relative to the great value of this product. It was also represented at the hearing that if saccharin should be considered a substitute for sugar, or even as an agent whereby the value of a food could be lowered, these features are entirely overcome by the willingness on the part of the manufacturer to declare the presence of saccharin upon the label of the goods in which it may be used. It is difficult, however, to conceive how it is possible to rectify a substitution or a lowering of the food value of a product by declaring the fact that a certain product is present. In fact, the word "saccharin" itself is a deception, and the vast majority of consumers would be unable to determine whether or not the name refers to sugar or to the artificial sweetener.

The literature on the poisonous or deleterious character of saccharin has been reviewed at some length. It shows that there is a difference of opinion on these points. Some observers refer to it as a poison, but these are in the minority. There should, however, be little doubt left in the mind of anyone who reads the literature extant relative to the investigations made in connection with saccharin but

that this product exerts a deleterious influence upon the human organism in one way or another. Experimenters usually arrive at the conclusion that saccharin acts injuriously upon the digestion. Its peculiar sweetness at times causes a diminished appetite. This property of saccharin can, in fact, be tested by almost anyone who will take the trouble to make a few experiments upon himself. There is a divergence of opinion as to whether or not saccharin inhibits the action of the various enzymes of the body, but it would seem that general observations are to the effect that it influences these enzymes but little, either one way or the other. Under these circumstances it would appear that the consumer rather than the manufacturer should be given the benefit of the doubt.

Manufacturers, as a rule, are guarded in their statements relative to saccharin being poisonous or deleterious. The claim is usually made that it is not a poison in the ordinary meaning of the term, and it is not deleterious in small quantities. While it is true that saccharin can not be considered a poison in the same sense that strychnin or morphin are poisonous, it certainly is not necessary for a product to be so virulent in its action as to rapidly destroy life when used in small quantities before it may be classed among the poisons. Moreover, strychnin may be given to normal adults in sufficiently small doses over long periods of time without manifestations of deleterious or poisonous action so far as may be determined by available methods; yet this would not remove strychnin from the category of poisons. Again, carbolic acid may be very beneficial to health under certain conditions, yet could it, for this reason, be said that carbolic acid was not deleterious?

The chief value of saccharin and its proper field is as a sweetening agent in food products used by diabetics. Medical men find the dietary of the diabetic is one of the most difficult to arrange. It is necessary to withdraw the carbohydrates, including sugar, to as large an extent as possible, which, of course, necessitates the removal of the sweetening effect of the sugar to a considerable extent. Every medical man is here placed in the position of choosing between two evils, i. e., the exigencies of the disease and the use of saccharin. If he finds that food sweetened with saccharin contributes to the welfare of the patient, such foods should certainly be employed as far as practicable. Such food, however, often becomes distasteful, nauseating, and repugnant. Under such conditions it certainly must do more harm than good. It should be remembered also that the patient is constantly under the supervision of the physician, and if the saccharinated food becomes detrimental it can promptly be withdrawn.

The number of observations made by the Referee Board are very small in comparison with the vast number that have been made

throughout the world. In a number of instances untoward symptoms were observed by the Referee Board in the persons experimented on. It is also clearly evident that the board did not base its conclusion solely upon its own data, but also upon the observations of others, as is evidenced by the fact that a goodly proportion of the work done by others is reviewed in the report made by the board. A careful reading of the evidence available leads to the inevitable conclusion that saccharin is a deleterious product leading to digestive disturbances when used indiscriminately in food products. Its useful and legitimate field is, as before stated, as a sweetener in the treatment of diabetics.

[Signed] L. F. KEBLER,
Chief Division of Drugs.

BRIEF OF ASSISTANT TO THE SOLICITOR, DEPARTMENT OF AGRICULTURE.

THE QUESTION.

SHALL THE THREE SECRETARIES PERMIT, WITHOUT PROSECUTION UNDER THE FOOD AND DRUGS ACT, THE USE IN FOODS OF LIMITED QUANTITIES OF SACCHARIN, PROVIDED THE PRESENCE OF SUCH SACCHARIN IS PLAINLY DISCLOSED UPON THE LABELS OF THE FOODS?

The manufacturers of saccharin, through their attorneys, have called upon the three Secretaries to reverse or modify the regulation promulgated by them in Food Inspection Decision 135, by which foods containing saccharin are declared to be adulterated under section 7 of the food and drugs act, because the findings of the Referee Board of Consulting Scientific Experts show that saccharin in food is such an added poisonous or other added deleterious ingredient as may render foods injurious to health, and also that the substitution of saccharin for sugar in foods reduces and lowers their quality. Briefs have been filed with the three Secretaries by attorneys representing the manufacturers, and this brief is prepared in reply by direction of the three Secretaries, it being understood that discussion of the facts stated by the manufacturers' attorneys will be made by the Bureau of Chemistry.

CONTENTIONS OF THE MANUFACTURERS OF SACCHARIN.

In asking the three Secretaries to reverse or modify the regulation, the attorneys for the saccharin manufacturers represent that the regulation is not justified by a correct interpretation of the findings of the Referee Board. They propose a modification amounting to a reversal of the regulation by which the use of saccharin in amounts not exceeding one one-hundredth gram in any one food will be permitted, with the assurance, if such permission be granted, that the saccharin manufacturers are willing to state on the labels of foods containing saccharin that no more than one one-hundredth gram of saccharin is used. Summarized, the contentions of the attorneys for the saccharin manufacturers are:

(1) Accepting the findings of the Referee Board and limiting the use of saccharin in any one food to one one-hundredth gram, saccharin added to foods in large or small quantities is not such a poisonous or deleterious ingredient as may render foods injurious to health, because the finding of the Referee Board that "Saccharin in large quantities (over three-tenths gram per day, and especially

over 1 gram daily) added to food, if taken for considerable periods of time (especially after months), is liable to induce disturbances of digestion," is entirely different from the findings that saccharin so used is "an added poisonous or other added deleterious ingredient" which may render such article injurious to health.

(2) Saccharin added to food in large or small quantities is not such an added poisonous or other deleterious ingredient as may render foods injurious to health, because the Referee Board has found that "Saccharin in small quantities (three-tenths gram a day or less) added to food is without deleterious or poisonous action and is not injurious to the health of normal adults so far as is ascertainable by available methods of study," and (b) because, if saccharin in any one food be limited to one one-hundredth gram, no individual could possibly consume in a day as much as one-half of three-tenths gram, quantities in excess of which are described by the Referee Board as large quantities.

(3) The finding of the Referee Board that the addition of saccharin to food as a substitute for cane sugar, or some other form of sugar, may be regarded as a substitution involving reduction in the food value of the sweetened product, and hence, as a reduction in quality; (a) contradicts the finding of the board that "the addition of saccharin with food in small or large quantities has not been found to alter the quality or strength of the food"; (b) is not responsive to the inquiries proposed by the Secretary of Agriculture; and (c) does not apply to any provision in the food and drugs act.

PROPOSITION.

IN THIS BRIEF I SHALL ASSERT THAT FOOD-INSPECTION DECISION 135 CORRECTLY REPRESENTS THE CONCLUSIONS OF THE REFEREE BOARD, AND IN VIEW OF THESE CONCLUSIONS NO COURSE WAS OPEN TO THE THREE SECRETARIES UNDER THE FOOD AND DRUGS ACT EXCEPT TO DECLARE THAT FOODS CONTAINING SACCHARIN ARE ADULTERATED UNDER THE FOOD AND DRUGS ACT.

1. SACCHARIN ADDED TO FOODS IS SUCH AN ADDED POISONOUS OR OTHER ADDED DELETERIOUS INGREDIENT AS MAY RENDER FOODS INJURIOUS TO HEALTH.

At the outset it is to be noted that the reasons advanced by the attorneys for the manufacturers of saccharin as showing that saccharin added to foods can not be regarded as such an added poisonous or other added deleterious ingredient as may render them injurious to health, are based upon two assertions of fact which are flatly contradicted by the briefs filed by the Bureau of Chemistry. In opposition to the assertion in the brief filed by Mr. Hough that the expression "a food containing saccharin in large quantities is liable to induce disturbances of digestion" is entirely different from a saying that such food contains an "added poisonous or other added deleterious ingredient, which may render the foods injurious to health."

Dr. Bigelow states:

It is evident that the difference between these two forms of expression did not occur to the Referee Board, *nor would it occur to any impartial physiologist. A substance which is recognized as liable to induce disturbances of digestion is believed to be injurious.*

Further, Dr. Kebler states:

The literature on the poisonous or deleterious character of saccharin has been reviewed at some length. It shows that there is a difference of opinion on these points. Some observers refer to it as a poison, but these are in the minority. There should, however, be little doubt left in the mind of anyone who reads the literature extant relative to the investigations made in connection with saccharin but that this product exerts a deleterious influence upon the human organism in one form or another. Most experimentists usually arrive at the conclusion that saccharin acts injuriously upon the digestion.

The findings of the experimentalists other than the Referee Board referred to by Dr. Kebler, that saccharin has an injurious effect on digestion are reflected in the laws of foreign countries, where the use of saccharin in foods has been prohibited, and its use as a therapeutic agent has been strictly regulated, for the reason that saccharin in foods is there regarded as detrimental to health. The decree of the Minister of the Interior of Austria of 1891, the decree of the Minister of the Interior of Japan of 1901, the decree of the Prince Regent of Portugal, 1888, the customs regulations of Russia, 1898, the saccharin law of Roumania, April 4, 1900, and the decree of the Minister of the Interior of Servia, 1902, all of which forbid or restrict the sale and importation of saccharin, are apparently based on the supposition that saccharin in foods may be injurious to health.

In opposition to the assertion of both attorneys for the manufacturers of saccharin, that if the quantity in any one food be limited to one one-hundredth gram no consumer could possibly get in any one day three-tenths gram of saccharin, Dr. Bigelow furnished a list of over 50 foods in common use in which saccharin has been found, and furnishes statistics from which it appears that if saccharin is used as recommended by certain manufacturers, the amount of saccharin which may be readily consumed in a day's diet may reach 0.45 gram. The statistics given by Dr. Bigelow do not include such additional quantities of saccharin as might be consumed in soft drinks in which the substitution of saccharin for sugar has been common.

From the facts so stated it is patent that no practical means exist whereby individuals may be safeguarded against consuming daily saccharin in quantities exceeding the quantities declared by the Referee Board as liable to induce disturbances of digestion, if the use of saccharin in foods be permitted within the limits proposed by the

attorneys for the saccharin manufacturers. The food and drugs act defines as adulterated not those added poisonous or deleterious ingredients in foods which produce a marked deleterious action, but foods "containing added poisonous or other added deleterious ingredients which *may* render such articles injurious to health." To amount to adulteration under this provision it is required that the poisonous or deleterious ingredient added to the food not actually renders, but is liable to render, the food injurious to health. The findings of the Referee Board show that saccharin in quantities which, according to the scientists of the Bureau of Chemistry, may readily be consumed each day in articles of daily diet, added to foods are liable to render the foods injurious to health. This form of adulteration can not be cured by the declaration of the quantity of the deleterious substance (saccharin) present in articles of food or by any other form of labeling.

THE FINDING OF THE REFEREE BOARD THAT "THE ADDITION OF SACCHARIN TO FOOD AS A SUBSTITUTE FOR CANE SUGAR OR SOME OTHER FORM OF SUGAR MAY BE REGARDED AS A SUBSTITUTION INVOLVING A REDUCTION IN THE FOOD VALUE OF THE SWEETENED FOOD PRODUCT, HENCE AS A REDUCTION IN ITS QUALITY," IS A FINDING THAT SACCHARIN ADDED TO FOODS REDUCES THE QUALITY OF THE FOOD.

The error of the attorneys for the saccharin manufacturers in asserting that the finding of the Referee Board that saccharin substituted for sugar in food reduces its quality is inconsistent with the finding "The admixture of saccharin with food in small or large quantities has not been found to alter the quality or strength of the food," and that the finding is not responsive to the food and drugs act, is apparently due to their failure to recognize the fact that these findings have regard to different classes of actions. In the one statement the Referee Board declares that saccharin mixed with food has no chemical action on the food; in the other statement, the Referee Board declares that the mixing of saccharin with food instead of sugar reduces the quality of the food. It has never been contended, so far as I am aware, that saccharin mixed with food has any chemical action on the other ingredients of the food. For example, if saccharin be added to succotash, or to the juice of lemons, or to chocolate it has not been contended that the quality of the corn and beans in the succotash, or of the juice of lemons, or of the chocolate is affected at all. All mixed and compounded foods which have been in general use have well-defined ingredients. The ingredient common in sweetened foods is sugar. Some of these foods in which saccharin has been substituted for sugar are confectionery, soda-fountain sirups, jelly, jam, preserves, ice cream, succotash, lemonade, and chocolate. In the preparation, for example, of sweet chocolate, which is a mixture of chocolate and sugar, under the findings of the Referee Board the quality, not of the chocolate, which is only one of

the ingredients of the food, but the quality of the food, that is, chocolate plus sugar, is injuriously affected. Likewise, if saccharin be substituted for sugar in the preparation of lemonade, which is a mixture of the juice of the lemon, water, and sugar, the quality of the ingredient, lemon juice, is not reduced, but the quality of the food, that is, lemonade, is injuriously affected. Similarly, in the preparation of succotash, the quality of the corn and beans is not reduced if saccharin be substituted for sugar, but the quality of the succotash, that is, corn and beans plus sugar, is injuriously affected.

Taking the example cited by Mr. Hough, it may be admitted that saccharin added to corn does not reduce the quality of the corn, but if in the preparation of canned corn of commerce, which has always been sweetened, customarily with sugar, saccharin be mixed with the corn instead of sugar, the quality is reduced not of the corn, but of the mixture of corn and sugar, which purchasers of canned corn expect and are entitled to receive.

The finding of the Referee Board that mixing of saccharin with foods in the place of sugar reduces the quality of the foods, therefore brings such foods within the first paragraph of section 7 of the food and drugs act, by which an article of food is deemed to be adulterated "if any substance has been mixed and packed with it so as to reduce or lower or injuriously affect its quality or strength." It is under this provision of law that the three Secretaries, in Food Inspection Decision 135 ruled that foods would be regarded as adulterated, because the substitution of saccharin for sugar reduced and lowered their quality. The Bureau of Chemistry declares that saccharin has no food value, and the Referee Board declared it to be obvious that the substitution of saccharin for sugar reduces the quality of sweetened food produces. The objection is raised to this finding of the Referee Board that they conducted no experiments regarding the food value of saccharin, and it is not justified by any of the experiments which were made by the board. This objection is met by the fact that the high food value of sugar, and absence of food value in saccharin, has been so generally recognized that the Referee Board declared the reduction in the quality of foods to be obvious when saccharin is used in the place of sugar. The superiority in food value of sugar over saccharin is recognized and made the basis of restrictive legislation and regulation in France, Italy, Belgium, Denmark, Greece, Spain, and other foreign countries. There was no occasion for experimentation by the Referee Board to determine an established scientific fact, and there is no escape from the conclusion of the Referee Board that the mixing of saccharin in the place of sugar in food reduces the quality of the food.

I have not overlooked the arguments advanced by Mr. Hough in his brief that the findings of the Referee Board with regard to sac-

charin in large quantities is practically identical with the findings of the Referee Board with regard to sodium benzoate in large doses. Mr. Hough urges the alleged similarity between these two rulings as the reason why the use of saccharin should be permitted, provided the quantity used be stated on the label. It needs no more than a casual observation of the two findings of the Referee Board to show that they are far from parallel. In the case of saccharin the finding was that saccharin in large quantities * * * added to food, if taken for considerable periods, * * * is liable to induce disturbances of digestion. This finding has been shown to be equivalent to the finding that saccharin in large quantities * * * added to food, if taken for considerable periods, * * * is liable to render articles of food injurious to health. The Referee Board, on the other hand, declared that sodium benzoate in large doses mixed with food had not been found to exert any deleterious effect on the general health nor to act as a poison in the general acceptance of the term. This finding is as far removed from the finding that sodium benzoate may render articles of food injurious to health as the English language can well make it.

CONCLUSION.

I conclude that the finding of the Referee Board establishes as adulterated foods to which saccharin has been added, because such foods contain an added poisonous or other added deleterious ingredient which may render them injurious to health, and because the substitution of saccharin for sugar in foods reduces their quality. As the injurious tendency of added saccharin can not be changed by any form of branding, obedience to the law and the regulations demanded that the three Secretaries should instruct the Secretary of Agriculture to consider as adulterated such foods containing saccharin as are subject to the prohibitions of the food and drugs act.

W. P. JONES,

.. *Assistant to the Solicitor.*

BRIEF OF SOLICITOR, DEPARTMENT OF AGRICULTURE.

THE QUESTION.

SHALL THE THREE SECRETARIES PERMIT, WITHOUT PROSECUTION UNDER THE FOOD AND DRUGS ACT, THE USE IN FOODS OF LIMITED QUANTITIES OF SACCHARIN, PROVIDED THE PRESENCE OF SUCH SACCHARIN IS PLAINLY DISCLOSED UPON THE LABELS OF THE FOODS?

I do not think that the three Secretaries wish or need elaborate briefs to assist them in deciding this question. A brief review of the history of the action on saccharin under the food and drugs act, a discussion of the findings of fact by the Referee Board, the pertinent provisions of the food and drugs act, the provisions of Food Inspection Decision 135, which it is sought to change, and a consideration of the functions of the three Secretaries under the food and drugs act, all point unmistakably to the conclusion that the principles announced in Food Inspection Decision 135 are correct and should stand.

HISTORY.

The question of the use of saccharin in foods was referred by the Secretary of Agriculture to the Referee Board on April 1, 1908, by direction of President Roosevelt. It will be seen that the reference was over three and one-half years ago, and during all of that time the use of saccharin in foods has been allowed. Food Inspection Decision 135 was issued on April 29, 1911, and by the terms of that decision no action was to be taken against foods containing saccharin until July 1, 1911. On May 23, 1911, Mr. Hamilton, the attorney for certain manufacturers of saccharin, appeared before the Secretary of Commerce and Labor and the Secretary of Agriculture and asked for an extension of time during which saccharin might be used in foods without prosecution under the food and drugs act. As a result of this hearing, on June 20, 1911, the three Secretaries issued Food Inspection Decision 138, which provided, in effect, that no prosecutions should be begun for the shipment in interstate commerce of foods containing saccharin until January 1, 1912. Certainly there is no hint of arbitrary or hasty action here. Every proper consideration has been extended to those who desire to use saccharin in foods. On November 22, 1911, Attorneys Hamilton and Hough, representing certain manufacturers of saccharin, appeared

before the Secretary of the Treasury, the Secretary of Commerce and Labor, and the Secretary of Agriculture and represented that Food Inspection Decision 135 did not correctly set out the conclusions reached by the Referee Board. On this representation the attorneys asked that Food Inspection Decision 135 be canceled and that in its place a decision be issued allowing the use in foods of limited quantities of saccharin, provided such use was disclosed on the labels.

The questions which were asked the Referee Board in regard to saccharin in foods briefly were these:

(1) Is saccharin in food a poisonous or deleterious ingredient which *may* render the food injurious to health? To this the Referee Board replied that, in small quantities (up to 0.3 gram daily), there was no evidence of injurious or deleterious action, but that the continued use of saccharin for a long time, in quantities of over 0.3 gram per day, is *liable* to impair digestion.

(2) Whether, if saccharin be mixed or packed with a food, the quality or strength of the food is thereby reduced, lowered, or injuriously affected? To this the Referee Board replied that the addition of saccharin as a substitute for cane sugar, or other forms of sugar, reduces the food value of the sweetened product and hence lowers its quality.

Both of these replies were directly responsive to the questions which were submitted.

THE PROVISIONS OF THE FOOD AND DRUGS ACT.

Under the terms of the food and drugs act an article is adulterated—

if it contain any added poisonous or other added deleterious ingredient which *may*¹ render such article injurious to health.

It is also adulterated—

if any substance has been mixed and packed with it so as to reduce or lower or injuriously affect its quality or strength.

Apply these provisions of law to the conclusions found by the Referee Board and there can be but one conclusion:

(1) The law says that a food is adulterated if it contains any added poisonous or deleterious ingredient which *may* render such food injurious to health. The Referee Board reports that the use per day, over a long-continued period of time, of over 0.3 gram of saccharin, is *liable* to impair the digestion. The law does not say that the added deleterious ingredient must *certainly* render the food injurious to health. The food is adulterated if the added ingredient *may* render the food injurious to health. The Referee Board, it is true, found, not that the use of over 0.3 gram of saccharin per day

¹ Italics are mine.

must certainly impair digestion and consequently injure health (because if the digestion is impaired, the health is injured), but they found that such use was *liable* to cause injury to health.

This finding, in connection with the fact, admirably illustrated in the statement of Dr. Bigelow, now before the three Secretaries, that if limited quantities of saccharin are permitted in foods, the consumer will often ingest more than 0.3 gram of saccharin per day, is sufficient grounds upon which to base a prosecution under the food and drugs act for the shipment, in interstate commerce, of foods containing saccharin. This is a form of adulteration which no manner or method of labeling will cure.

(2) The law says further that a food is adulterated if any substance has been mixed with it so as to reduce or lower or injuriously affect its quality or strength. The Referee Board found and reported to the Secretary of Agriculture that saccharin in food, as a substitute for cane sugar, or other forms of sugar, reduces the food value of the sweetened product, and hence lowers its quality. No specious arguments can change the fact that the sweetener in universal use to-day in prepared food products is understood to be sugar. Hence, every time that saccharin is used in a prepared food mixture as a sweetener (and it has no other use), it is used as a substitute for and in place of sugar. Sugar has a food value; saccharin has none. Sweetening value considered, saccharin costs but a tithe of the cost of sugar. The food value and the money value of the mixture containing saccharin are considerably less than the food value and money value of the mixture containing sugar.

The spokesman of the system is the appetite and the check on the appetite is the palate. When the system needs the food values found in sugar, the appetite craves sweetness. When sugar is given, the palate is pleased, the appetite is satisfied, and the system receives its needs. When saccharin is given, true the appetite is sated, but the palate is deceived and the system is cheated.

PROVISIONS OF FOOD INSPECTION DECISION 135.

Food Inspection Decision 135 recites the conclusions of the Referee Board hereinbefore referred to, points out that saccharin is used in a large number of foods; states that these foods, in view of the findings of fact of the Referee Board, are adulterated under the food and drugs act, and says, in effect, that no prosecutions will be begun under that act for the use of saccharin in food until a certain date. There is no attempt in this decision to forbid anybody from using saccharin in foods. It is simply a notification to the manufacturers of the country of the findings of fact of the Referee Board, of the adoption of these findings by the three Secretaries, and notice that those who on and after a certain date continue to sell foods contain-

ing saccharin within the jurisdiction of the food and drugs act must be prepared to defend their action in the Federal courts.

THE FUNCTIONS OF THE THREE SECRETARIES.

Under the Food and Drugs Act the three Secretaries form an administrative board, charged with the duty of making regulations to aid in the enforcement of the act. This board is not a *nisi prius* court to try the facts, nor is it a court sitting *in banc* to apply the law. It is merely an administrative agency, one member being charged with the duty of presenting, for the consideration of the courts, violations of the law and of the regulations of the board made under that law. It is, of course, axiomatic that the violation of the regulations can not be punished unless it is also a violation of the law. Certain regulations have been made and promulgated by this board. One of those regulations (15) makes it the duty of the Secretary of Agriculture to determine the principles which shall guide the use of substances added to foods, and also provides that such principles, when approved by the other two Secretaries, shall become a part of the regulations. Applying this regulation to saccharin, the Secretary of Agriculture referred the question of its physiological and other effects to the Referee Board. The Referee Board made its report. The Secretary of Agriculture approved this report and submitted it to the other two Secretaries, who also approved it.

The normal effect of this action is to bring into court the question as to whether or not the use of saccharin in foods is a violation of the food and drugs act. If the three Secretaries, in the face of the finding of fact of the Referee Board, were to accede to the request of the attorneys for the manufacturers and allow saccharin to be used in foods, without submitting the legality of such use to the courts for their determination, they would be forgetful of their functions. This does not mean that there is any obligation upon the part of the three Secretaries, or of any one of them, to take action which will result in prosecutions under the food and drugs act upon the mere *ipse dixit* of some person who may imagine that certain practices are unlawful. It simply means that after the three Secretaries have exhausted the best scientific means available for discovering the facts, they should be guided by the facts so disclosed, and leave the final determination to the courts.

CONCLUSION.

As has been pointed out in this memorandum, the Government has been considerate of the manufacturers of saccharin to the last degree, and no valid complaint can be made by the manufacturers of saccharin or by any person desiring to use saccharin in foods if at this time,

having exhausted the machinery of their respective departments in an investigation, the three Secretaries are guided by the facts disclosed by the investigation and report the matter to the courts for further determination. The fact of the matter is that the use of saccharin in food was conceived by cupidity, born of avarice, suffered for a time by the lawmakers, stigmatized by the Referee Board, condemned by the three Secretaries, forbidden by the laws of enlightened nations and States, is dead and buried beyond the hope of resurrection, and it only remains for the honorable Secretaries and the courts now to pronounce its obituary.

GEO. P. McCABE,
Solicitor, Department of Agriculture.

REPLY BRIEF BY FRANCIS E. HAMILTON.

To the honorable Secretaries JAMES WILSON, FRANKLIN MACVEAGH,
CHARLES NAGEL.

GENTLEMEN: Replying in brief to the statement of Drs. Wiley, Kebler, Bigelow, and Solicitor McCabe, and the Assistant Solicitor, I desire to call attention to the following facts:

Saccharin has *not* been declared to be poisonous by the Referee Board of Consulting Scientific Experts.

Saccharin in quantities up to 0.3 gram has not been declared to be deleterious or otherwise dangerous to the health of the people of the United States by said board.

The list of 30 foods given by Dr. Bigelow as containing saccharin is not correct.

Canned corn,	Canned peas,	Caponata,
Sugar,	Confectionery,	Jelly,
Jam and marmalade,	Preserves,	Corned beef,
Cured bacon,	Sweet pickles,	Cassoid biscuit,
Cakes,	Mustard,	

all given in the list by Dr. Bigelow, do *not* contain saccharin and have not for several years.

The menus given by Dr. Bigelow for daily use by child and adult are incorrect, as follows:

Menu No. 1.—Does not contain saccharin in strawberries, 0.5 gram; oatmeal, 0.04; dessert, 0.03; cake, 0.04. This would reduce the total quantity in this menu to 0.19 gram.

Menu No. 2.—Apple sauce does not contain saccharin 0.05 gram; oatmeal, 0.05; cake, 0.04; fruit and cake, 0.09. This would reduce the total saccharin in this menu to 0.09 gram.

Menu No. 3.—Strawberries do not contain saccharin, 0.05 gram; oatmeal, 0.04; coffee, 0.03; dessert, 0.03; cake, 0.04; coffee, 0.03. This would reduce the quantity of saccharin in this menu to 0.23 gram.

Menu No. 4.—Fruit does not contain saccharin, 0.05 gram; cereal, 0.04; coffee, 0.03. This would reduce the quantity of saccharin in this menu to 0.134 gram.

All of the articles above mentioned, charged with containing saccharin in Dr. Bigelow's list, can contain it only if added by the individual, and this can be done no matter what regulation is made by

the Pure Food Board. It therefore is a false conclusion to state that such a quantity would be consumed by an individual based upon a fictitious estimate of the amount which the individual would use in these various foods.

The entire argument of Dr. Bigelow is not sustained by the facts.

The question under discussion is the use of saccharin by manufacturers of foods and not the control of the use of saccharin by individuals. No power rests in the Pure Food Board or in the Board of Secretaries to determine whether or not any individual shall use saccharin with his strawberries, or his oatmeal, or his coffee, if he chooses so to do.

Eliminating from Dr. Bigelow's argument all that pertains to the individual use of saccharin, the argument fails utterly to show the possibility of any consumption in excess of 0.3 gram per diem.

The argument of Dr. Kebler does not go to the root of the matter, but discusses conclusions reached by experimentists and misstates those conclusions in that he says:

Most experimenters usually arrive at the conclusion that saccharin acts injuriously on the digestion.

Of the 40 references to experimentists given in the report of the Referee Board of Consulting Scientific Experts, *seven* only criticize saccharin as acting in any manner injuriously upon the digestion, while *eighteen* of these experimentists specifically approve the use of saccharin and recommend its use.

The discussion by Dr. Kebler of the prohibition of saccharin in foreign countries fails to state the entire truth in the matter, which is that in almost every foreign country the entire question of the use of saccharin rests upon the question of revenue, and its prohibition has been for the purpose of protecting the revenue derived from sugar and not because of any evil ascribed to the use of saccharin.

The arguments presented by Solicitor McCabe apply with equal strength to all condiments known to humanity—salt, sugar, pepper, allspice, capsicum, ginger, and as well to the use of tea or coffee, and very positively to the use of alcohol.

In other words, were any of the above condiments, or tea, or coffee, or alcohol, used in *certain quantities* they would not alone be *liable to*, but, beyond any question would, destroy health, while the use of alcohol would kill.

The pure-food act specifically forbids the addition of anything which shall "lower the strength" of the "food."

The report of the Referee Board says that the use of saccharin in lieu of sugar necessarily reduces the food value of the "sweetened product"; but this is not a reduction in the slightest degree of the nutritive value of the "food."

The attempt of the Solicitor or his assistant to confine the authority of the three Secretaries to the approval of a regulation made by the Pure Food Board is again beside the question. The law specifically directs that the three Secretaries shall make uniform rules and regulations for carrying out the provisions of this act, and in this particular case, the three Secretaries having before them the report of the Referee Board of Consulting Scientific Experts, are supposed to base their regulations upon the conclusions found in that report.

The remarks of Dr. Wiley in his letter submitting the so-called briefs of Dr. Bigelow and Dr. Kebler are simply expressions of his personal opinion and of his antagonism to the use of saccharin and should only have such weight as would be given to the expressed opinion of any individual, irrespective of his official position.

This question was recently decided in the Circuit Court of Appeals, where Dr. Wiley had expressed a personal opinion as to the edibility of olive oil.

Finally it is submitted that nothing has been submitted on the part of the above gentlemen to vary or weaken the position taken by the Referee Board, to wit, that saccharin is absolutely noninjurious in food within certain defined limitations; and, since a regulation can be made positively fixing those limits and protecting the public health, we believe that we are entirely within our rights to demand the issuance of the same.

All of which is respectfully submitted.

FRANCIS E. HAMILTON,

Of Counsel for Saccharin Manufacturers.

32 BROADWAY, NEW YORK, *December 13, 1911.*

REPLY BRIEF BY W. M. HOUGH.

I.

The briefs of Dr. Wiley, Dr. Bigelow, Dr. Kebler, and Solicitor McCabe are rather arguments *in favor of* the use of sugar as a sweetener of foods than briefs on the proper interpretation to be given to the conclusions of the Referee Board *squared* with the provisions of the food and drugs act. The brief of the assistant to the solicitor on the latter point is based upon two statements of fact in the briefs of Dr. Bigelow and Dr. Kebler, which are supported only by their own *ipse dixit*. The small discussion of law in all of the briefs is so mixed with a large discussion of facts as to be more or less misleading. This necessitates a reference to some facts before replying to their law points.

Saccharin is a mineral product, but so are salt and water and a number of other substances which enter into the composition of food which possess no food values whatever.

While the human system needs foods containing fat, protein, and carbohydrates, it also needs foods containing minerals.

In Circular 110, issued March 25, 1911, by the United States Department of Agriculture, entitled "Food customs and diet in American homes," on page 22 appears the following extract from an article prepared by Dr. C. F. Longworthy:

To be most useful, dietary standards should take into account the amount of ash constituent required by the body, for it is well known that mineral matters of different source are essential for use in forming bones and other body tissues for repair of the body and for other purposes.

The excess quantities of these minerals, including salt, pass through the kidneys, and always did do so, long before saccharin was discovered. Therefore there is nothing in that point made in Dr. Wiley's brief. His other arguments against the use of saccharin are contrary to the well-known views of thousands of physicians who prescribe the use of saccharin as they would recommend the use of one kind of meat in preference to another, and the only limitation upon the amount of saccharin is the *taste* of the consumer.

In Farmers' Bulletin No. 93, entitled "Sugar as Food," issued by the Department of Agriculture December 21, 1906, appears the following statement:

The sugar cane is a gigantic jointed grass (*Saccharum officinarum*), native in eastern India and China, numerous varieties of which are now grown in the tropical and subtropical regions of both hemispheres. Sugar from the sugar cane was probably known in China 2,000 years before it was used in Europe. When merchants began to trade in the Indies it was brought westward with spices and perfumes and other rare and costly merchandise, and it was used for a long time exclusively in the preparation of medicine. An old saying to express the loss of something very essential was, "Like an apothecary without sugar." Greek physicians several centuries before the Christian era speak of sugar under the name of "Indian salt." It was called "honey made from reeds," and said to be "like gum, white and brittle." But not until the middle ages did Europeans have any clear idea of its origin. It was confounded with manna or was thought to exude from the stem of a plant, where it dried into a kind of gum. When in the fourteenth or fifteenth century the sugar cane from India was cultivated in northern Africa the use of sugar greatly increased, and, as its culture was extended to the newly discovered Canary Islands and later to the West Indies and Brazil, it became a common article of food among the well to do. In 1598 Hentzer, a German traveler, thus describes Queen Elizabeth, then 65 years of age: "Her nose is a little hooked, her lips narrow, and her teeth black, a defect the English seem subject to from their great use of sugar." By many the new food was still regarded with suspicion. It was said to be very heating, to be bad for the lungs, and even to cause apoplexy. Honey was thought to be more wholesome, because more natural than the "products of forced invention."

From articles in encyclopedias we learn that for more than 1,000 years after it became known in Europe it was regarded as a poison and dangerous to health, and its use was opposed by the beekeepers of the world.

All of this is interesting in view of the present attack which the sugar chemists and the sugar papers are making upon saccharin.

In an article on "Diet," prepared for the New York World by Dr. W. Ayres, and printed in the Evening World of July 6, 1911, on the editorial page, appears the following statement:

Sugar does more harm than any other variety of food. This is particularly true of the city man. The man who lives in the country and exercises in the open air can take care of the sugar contained in his food. Sugar has a tendency to ferment in the intestines before it has had time to be absorbed into the blood.

This fermentation causes gastritis, enteritis, and colitis.

There is certainly nothing in scientific opinions of this character to justify the clamor for *sugar as a sweetener* instead of a product (saccharin) which produces none of those results.

In the briefs referred to above the fact is constantly harped upon that sugar has a food value while saccharin has none, and that saccharin costs but a tithe of the cost of sugar; while the same thing could be said of salt and water, such statements only beg the question. The Solicitor of the Department of Agriculture correctly states that President Roosevelt referred this question to the Referee Board; and he did it because his own experience refuted the statements then being made by Dr. Wiley that it was a poison and deleterious to health. There is no question here as to the consideration which has been shown to the manufacturers of saccharin by the Department of Agriculture. The only question is as to whether the Referee Board found that saccharin added to food was an "added poisonous or other added deleterious ingredient which may render such article injurious to health" within the meaning of that term as used in the food and drugs act, or whether, if added to food, its addition reduced or lowered or injuriously affected the quality or strength of the food to which it was added.

The conclusions of the Referee Board must be construed in the light of the résumé and conclusions of the individual experimenters. These are contained in Report No. 94, "Influence of saccharin on the nutrition and health of man," issued by the Department of Agriculture November 15, 1911. On page 233 it appears that Dr. Folin conducted his experiments upon 12 young men from among the students of the Harvard Medical School; that the doses were taken with every meal for a period of about five months, ranging from 0.05 gram to 0.95 gram per day.

The amounts taken would therefore seem adequate to cover any practical use of the drug for sweetening purposes. Indeed, the character of the saccharin serves as an effective barrier against its being used in very large amounts. It is used chiefly as a sweetener and only in a very minor degree, if at all, as a preservative. Its preservative effects appear, in fact, to be very small indeed. Its taste, an extreme sweetness in dilute solutions, merges quickly into an intense and persistent bitterness when the concentration of the product is materially increased.

On page 234 he says:

Considering the number of men involved, the length of the experiment, and the amounts of saccharin given, the negative character of the results obtained indicates that, so far as can be ascertained with methods at present available, saccharin in moderate doses is not injurious to the health of normal sound adults.

On page 235 he further finds:

The men taking it [saccharin] were not informed and were unable to tell from the taste when the dose was increased. They took the final dose of 0.25 grams as well as they did the initial dose of 0.05 gram, and never knew the difference. This final very large dose was also taken by the controls, subjects A to E, who previously had not had any saccharin. This was done in order to determine whether the subjects proper had become habituated to the drug and, therefore, would be better able to stand such a large dose than would the controls. The result of this last test was negative. Neither subjectively nor from the standpoint of metabolism could any material difference be found in the reaction of the subjects to the administration of saccharin.

Nothing, therefore, in the experiments of Dr. Folin justified a conclusion that, in the amounts consumed by his students, saccharin was an "added poisonous or other added deleterious ingredient which may render such article injurious to health."

The investigation carried on under the direction of Dr. Herter was performed on six subjects, commencing with 0.3 gram daily and increasing the dose to 1.5 grams per day. This continued through a period of about five months. One of the subjects was not robust at the commencement of the experiments, as he complained of headache from time to time. From the beginning this man states that he was in good health and spirits, except on certain days, when he suffered chiefly from headache; but the discontinuance of the use of saccharin failed to be followed by the cessation of the headache.

After an interval of two weeks the use of saccharin was resumed, the dose being raised to 1 gram daily, during which time he had less headache than on previous occasions. Later the dose of saccharin was raised to 1.5 grams daily, which was continued for a week, and during this time there was *no recurrence of the headache*.

These clinical notes will be found on page 15 of the printed report. Dr. Herter comes to the conclusion (p. 16) that the disturbances noted in this subject were probably in no way connected with the intake of saccharin, but he says (p. 16):

Nevertheless from the nature of the case it is clear that the conclusion just stated merely represents the fairest inference that seemed to be permissible, and I do not consider it absolutely proven that the taking of saccharin was not in some obscure way connected with the disturbances noted.

This conclusion is negative, but it seems to be all that there is in the report to justify the conclusion arrived at by the entire board that saccharin in large quantities is *liable* to induce disturbances of the digestion.

It is an error to say, as was said in the brief of the Solicitor of the Department of Agriculture, that saccharin is forbidden by the laws

of enlightened nations. England is regarded as among the most enlightened of all nations, and the use of saccharin in foods is freely permitted in that country. There is no act of Congress against its use in this country, but the agents of the sugar interests have succeeded in having laws passed against its use in a few of the States. The only chemists in Europe who have declared against the use of saccharin were the chemist representatives of certain sugar interests. All independent investigations have found that saccharin was absolutely harmless.

Dr. Bigelow's table of daily diet proves absolutely nothing. He might just as easily have increased his figures as to the amount of saccharin in each food and thus increased his totals, because he uses very much more than is necessary to be used. His tables showing a possible daily consumption of 0.45 gram is no answer to the proposition that, if the use of saccharin in foods is limited to 0.01 of 1 per cent, it would be impossible for any consumer to get an average daily consumption of as much as 0.3 gram; for while it is possible for a man to eat, even for seven days, in excess of 6 pounds daily, he can not keep it up for weeks, much less months; and the worst that is said against saccharin is that if it was consumed *for many months in excessive quantities, particularly above 1 gram daily*, it was liable to create disturbances of the digestion.

It should be perfectly obvious to any impartial mind that the Referee Board did not find saccharin to be an "added poisonous or other added deleterious ingredient" within the meaning of that phrase as used in the law, and therefore there should be no more prohibition upon its use than the three Secretaries imposed upon the use of sodium benzoate; and the limitation suggested was wholly in deference to a *pretended fear* on the part of some advocates of sugar that some consumer might get continuously for months more than an average of 0.3 gram daily.

II.

Had the conclusions of the Referee Board terminated with the first and second conclusions and the first paragraph of the third conclusion, no one, I think, would seriously contend that the use of saccharin in foods should be held to be a violation of the food and drugs act. But the Referee Board, after saying—

The admixture of the saccharin with food in small or large quantities has not been found to alter the quality or strength of the food,

added the following:

It is obvious, however, that the addition of saccharin to food as a substitute for cane sugar or some other form of sugar

must be regarded as a substitution involving a reduction of the food value of the sweetened product and hence as a reduction in its quality.

The fact that the board states that this conclusion is "*obvious*" indicates that it is not, in their opinion, a *scientific* conclusion, but rather a *logical* conclusion. The treatment of this part of the report of the Referee Board in the brief of the Solicitor of the Department of Agriculture and his assistant is disingenuous. There is nothing in the food and drugs act which says or justifies the contention that the formula of mixing foods for consumption shall never be changed and, therefore, that if some manufactures have used cane sugar to mix with succotash no other manufacturer shall ever mix anything else with succotash which might happen to have a less food value than cane sugar; and yet this, in substance, is their argument. The mere statement of the proposition shows its absurdity. There is no limitation whatever in the law against the mixing together of any articles not otherwise poisonous or deleterious to health, and an article which is only deleterious to health in that it is likely to create disturbance of the digestion when it is used in excessive quantities is not such an article as was contemplated by the law when that particular paragraph was framed; otherwise an inhibition could be established against any form of food, because, forsooth, it might be sometimes used to excess, and any kind of food used to excess is not only *liable* to but will absolutely "induce disturbances of digestion."

The law says that an article of food shall be deemed to be adulterated—

If any substance has been mixed and packed with it so as to reduce or lower or injuriously affect its quality or strength.

The quality or strength of what? Why, obviously, the quality or strength of the food to which the substance is added or with which it is mixed or packed. There is nothing in the law which says that an article of food shall be deemed to be adulterated if any substance having a low food value or no food value at all is mixed or packed with it, when you might have mixed or packed with it a substance having *some* food value or a *higher* food value.

The solicitor wholly misconceives the meaning of that provision of the law, and his and his assistant's argument, on this point, is represented by a cat in the act of swallowing its own tail.

Why should so much concern be exhibited in behalf of sugar? Why should the diabetic, suffering from the excessive use of sugar, be denied the right to have his food sweetened with saccharin? What is there so sacred about the rights of sugar, that they can not be safeguarded by a distinct declaration on the label to the effect that the article has been sweetened by saccharin and *not by cane*

sugar? There could be no charge of deception in such a case; there could be no charge of substitution in such a case; and the quality or strength of the food to which the saccharin was added could not be charged to have been reduced or lowered or injuriously affected. Why should not the consumer be permitted to choose his food?

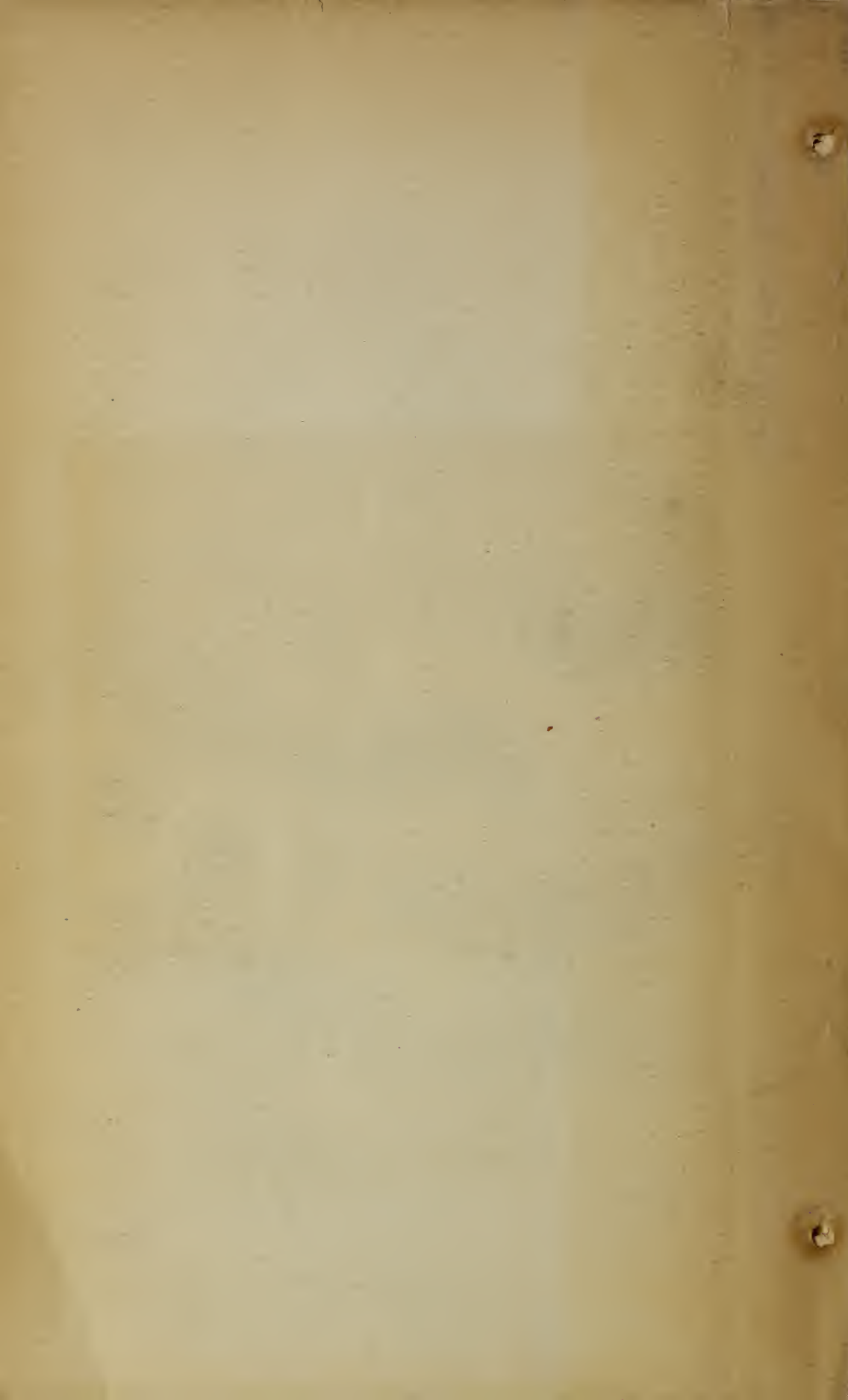
Counsel is too ready to suggest court proceedings under a regulation which destroys the business in the meantime. Of what use are the Referee Board and the three Secretaries but to obviate such a destructive proceeding when they find that a particular substance is not a poisonous or deleterious ingredient?

Food Inspection Decision 135 does not correctly interpret the conclusions of the Referee Board, *in the light of their full and complete report*, and should be modified; and to permit it to stand would be to commit as great a scientific error as that which condemned Bruno and Galileo as heretics because of their belief in the Copernican theory.

Considering the boon to humanity which saccharin is, to prohibit its use would be a crime against nature.

WARWICK M. HOUGH,
Attorney for Monsanto Chemical Works.





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